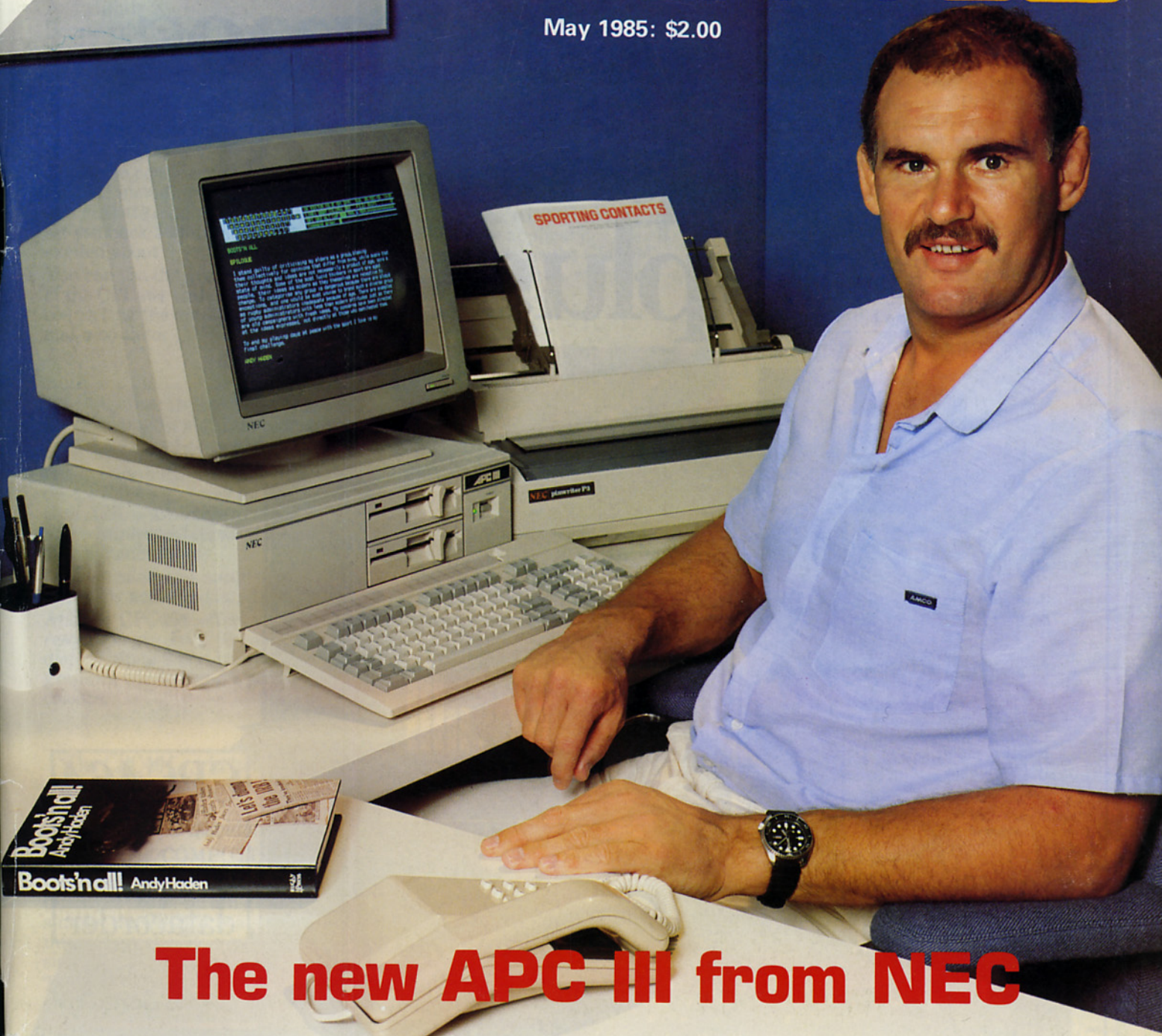


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NEW ZEALAND'S PERSONAL COMPUTER MAGAZINE

# BITS & BYTES

May 1985: \$2.00



## The new APC III from NEC

Commodore Plus 4 — A true small business micro?

Senior Partner — the complete portable?

Columns for all popular micros  
— including enlarged C 64 coverage

**PC 85** The New Zealand Personal Computer Exhibition Overseas Terminal Auckland 9-10-11 May 1985

PC 85 — complete catalogue inside

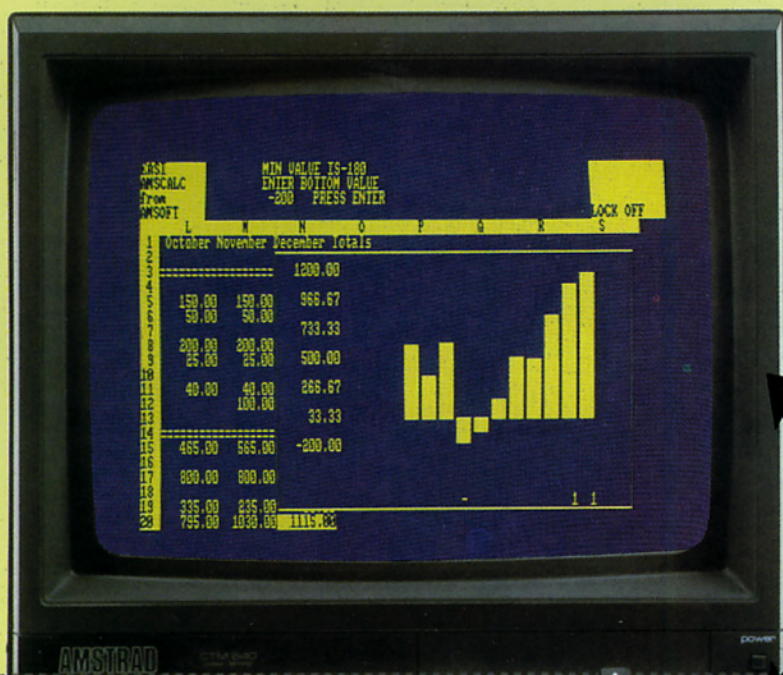
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datacoder



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---

**"I think the Amstrad will give a lot of sleepless nights to Sinclair, Acorn and Commodore ..."**

---

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**"The CPC464 ... in two boxes and one lead includes a list of features that would shame a hybrid of the major machines."**

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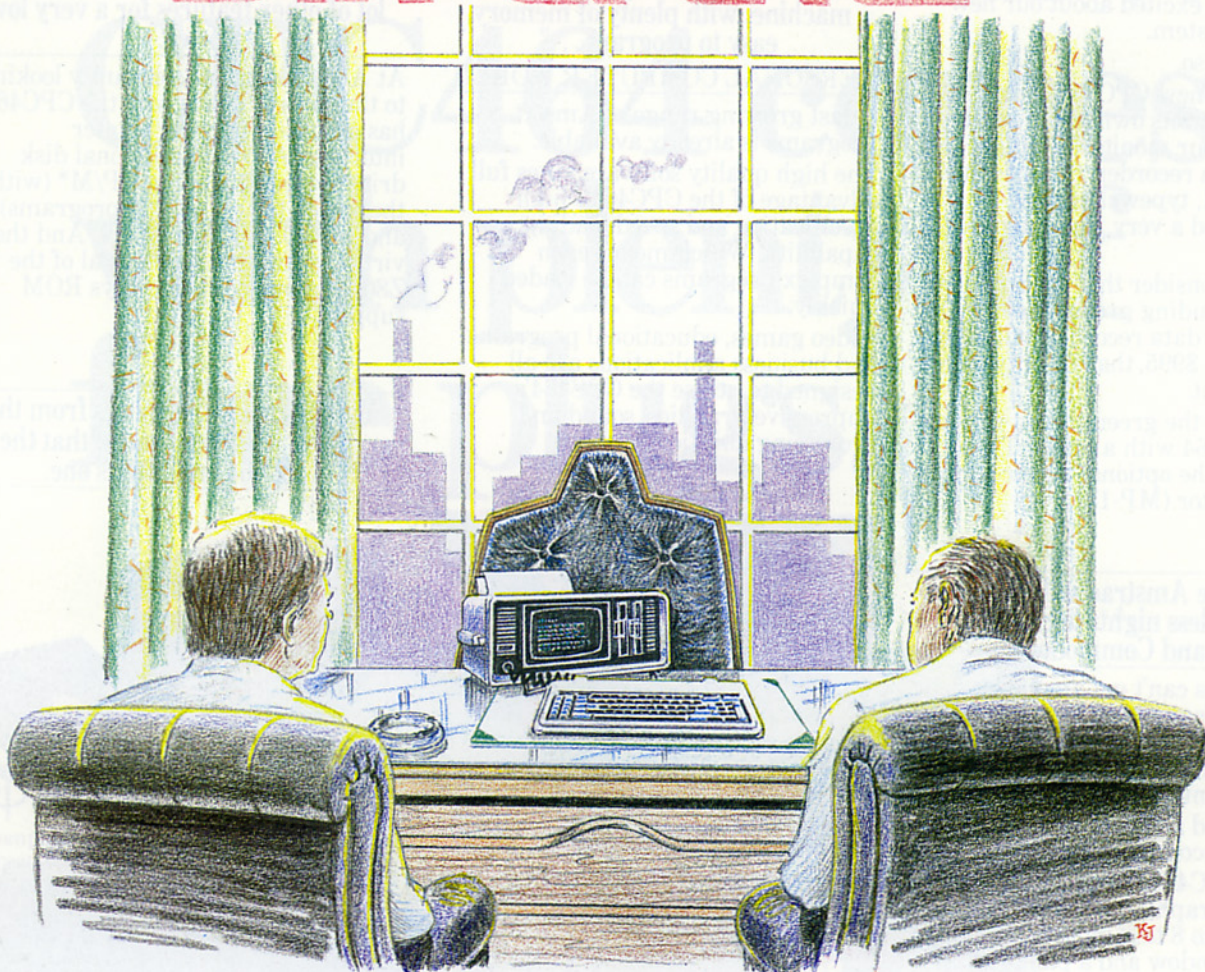
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# BITS & BYTES

May, 1985 Vol. 3, No. 8

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## FEATURES

### Hardware reviews

Gordon Findlay spent nearly a month living with the new NEC APC III. And he reckons Andy Haden knows a thing or two about computers as well as rugby lineouts. Why? Gordon tells all. 13

Sr Partner conjures up all sorts of things for Bevan Clarke's fertile imagination. Read his mind on Panasonic's briefcase computer. 6

Commodore has released its Plus 4 to stand alongside the highly successful 64. Peter Ensor looks at the Plus 4. 18

### Software review

A pleasant and powerful tool for handling small data sets . . . that's Pip Forer's assessment of FileVision. He puts his case. 28

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### Printer survey delayed

Lack of space has forced us to delay our survey of dot matrix printers available in New Zealand until June. This will be followed by a survey of daisy wheel printers.



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# PC 85 — not to be missed

PC 85, on May 9, 10, 11 at the Overseas Terminal, Downtown, Auckland, will be the largest computer event ever held in New Zealand.

More than 60 companies, covering 150 stands and two floors of the Overseas Terminal will be exhibiting.

The exhibitor list reads like a who's who of computing in New Zealand (see catalogue in this issue) and several have indicated they will be releasing new products at the exhibition.

The exhibition will be open from 9am to 5pm on the Thursday and Saturday, and 9am to 7pm on the Friday.

The exhibition will be open to trade and business people on Thursday and Friday, and to the general public

on Friday afternoon and Saturday. Admission is \$3 for adults and \$1 for children (if accompanied by an adult) for those without business passes.

Those attending the exhibition will also have the opportunity to win one of two Spectravideo computers (see catalogue for further details).

But PC 85 is more than just an exhibition. A series of industry-related and general computing seminars will be presented by New Zealand and overseas experts during the three days (again see catalogue for further details).

And on the Thursday evening, the first New Zealand Microcomputer Software Awards will be presented by the Minister of Overseas Trade, Mr Mike Moore, at a dinner which will also feature a keynote speaker from overseas.

## 'Guru' as key speaker

Adam Osborne — the man who started the whole portable computer revolution and sometime industry guru — will be the keynote speaker at the first Microcomputer and Software Awards.

Osborne, frequently described as something of a phenomenon in the industry, was an engineer who established a publishing and technical writing company in USA in the early 60s.

The company developed into a major publishing empire which he later sold to McGraw-Hill.

As a publisher, Osborne often chastised computer manufacturers which he felt were not performing well. When his prodding failed to trigger computer companies to build new types of computers, he decided to get into the manufacturing business himself.

This move saw the development of the Osborne 1 — the first portable computer and the first to be sold under the bundled software concept.

Today, Osborne heads a software company known as Paperback Software.

## MICRO MOMENTS

BY MATT KILLIP



# Micro software awards

New Zealand's fledgling micro-computer software industry will receive a boost with the presentation of the first New Zealand Microcomputer Software Awards at PC 85.

Around 35 entries were received for the awards which are being judged in two categories — business and farming, and education and recreation.

Entries range from highly successful commercial packages that have been on sale for some time to spare-time labours of love on the behalf of individuals whose efforts have yet to become commercially available.

One judge (in consultation with others) is responsible for reducing the entries in each category down to three finalists. In the business and farming category, the judge is Greg Barton, manager of systems development at Databank, while in the education and recreation category, the judge is John Slane, a Department of Education schools inspector and reviewer for *Bits & Bytes*.

From the three finalists in each category, a category winner and overall winner will be selected by a panel including the judges and representatives of the sponsors *Bits and Bytes*, Imagineering and the New Zealand Technology Advancement Trust.

The winners will be kept secret until Thursday, May 9 when the Minister of Overseas Trade, Mr Mike Moore, will announce them at an industry dinner.

The overall winner will receive \$2000 and it is hoped all the finalists will be able to use the recognition gained from the awards in marketing their software in New Zealand and, in particular, overseas with a view to export earnings.

For individuals and smaller organisations, the awards provide an opportunity to become known to larger organisations who may be able to provide the marketing and distribution support otherwise lacking.

It is also hoped the awards will provide more incentive for New Zealanders to write and develop software.

## Videotex delays

A series of technical problems have delayed the launch of the *Bits & Bytes* videotex service aimed at microcomputer users.

The major problem is the almost complete lack of suitable modems for micro users to access the service. Only three videotex suitable modems have been type-approved by the Post Office and two of these cost more than \$1000.

One of the other problems is finding suitable terminal software that will allow the downloading of telesoftware.

However, we expect these problems to be overcome in the near future and we hope to announce a definite launch date soon — so please be patient.

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### PANASONIC SR PARTNER

# Portable, compatible & a printer

By Bevan J. Clarke

What does the label, "Sr. Partner", suggest to you? The new Mexican member of your firm? The Panasonic brand is widely respected as a sign of quality and Matsushita, of Japan, hopes that naming its latest portable computer the "Senior Partner" will give it such mana every rising accountant and manager will be anxious to carry one into clients' offices.

The Senior Partner is not a tiny brief-case computer — it's one of the breed of so-called "portables" (perhaps better called "luggables"). You may well ask the office junior to carry it for you. Even with a well-padded carry handle on one end, the Senior Partner is not light — 15kg. After too many trips the length of a domestic airport terminal, you'll be asking your tailor for a longer right sleeve. Nevertheless, it is far more pleasant to carry your computer to the car in one trip rather than four.

The Senior Partner is a bundle well worth carrying: it's a sturdy, cream, dumpy (47 x 33 x 21cm) unit which contains an 8088/8087 processor, two disk drives (or one disk drive plus a 10Mb hard disk) and a silent thermal printer. Moreover, it comes with high-resolution graphics built in (for its green screen) and a port for an add-on colour RGB screen. It has a socket for an 8087 maths co-processor but I suspect it would take nearly total disassembly to reach it.

The computer takes only moments to set up. The keyboard unclips to reveal the 9in green screen and the disk drives. A chromed bracket, folded around a long edge, swings down to become a support which lifts the screen to an ergonomically sound viewing angle. The screen is not at all obscured by the keyboard. A compartment at the rear stores the power cord but there is no space to store floppies.

Since IBM introduced the PC with its non-selectric keyboard, reviewers have been expected to curse keyboards. But person-kind is now used to the new de facto standard. The Senior Partner has a pleasant 84-key keyboard in charcoal and gray with excellent PC compatibility



*The Panasonic Sr Partner*

Picture courtesy of University of Canterbury audio-visual aids department

and a good "feel" to the keys. It does not clatter!

Two sprung legs can be used to tilt the board to a comfortable angle. The curly cable (which could well be longer) lurks behind a silly bung on the front panel and a fiddly little plug must be inserted into the edge of the keyboard before play can commence. RETURN (ENTER) is a big fat key but the ALT and CAPS LOCK keys are too large and the SHIFT keys too small. Sigh! If only they

would ask a user!

The 9in screen is just fine for viewing from normal distance but does not have an etched surface. It will reflect any windows or bright lights behind you. There are no annoying streaks on the screen because the green is not a long-persistence phosphor.

Text is displayed with what my eyes see as a rather coarse raster — only as good as an IBM colour card rather than the crisp IBM mono-



chrome text. But, like competing portables the Senior Partner does not waste an expansion slot on a colour/graphics board — it is built into the motherboard and provides 640 x 200 pixels in monochrome or 320 x 200 in colour.

Sixteen colours are available in text mode and two palettes of four colours in graphics. On the green screen, all these colours map into shades of green. Plug an RGB monitor (or a projection TV for conference or board room) into the port at the back and you can see full colour simultaneously.

Two 360Kb drives give 720Kb on eight or nine-sector IBM compatible floppies. In action, they buzz like irritated wasps but seem completely reliable.

Across the rear of the machine, you find fuse and power switch (don't they trust me with a switch at the front?), IBM RGB monitor port, brightness control (grope! fumble!), Centronics parallel port, RS232 serial port and an access panel for one of the two expansion slots. If you can be bothered to use it, a loose metal plate clips over all these and the cable-storage cubby.

The 80/132 column, silent, Epson-compatible thermal printer lives under a hatch on the top. This printer is probably the machine's strongest selling point after PC compatibility and low price. The 8in-wide roll of thermal paper slides under a tear-off bar. If you should wish to address another printer then ALT/PrtSc (what else?) will re-assign output to the Centronics port!

The printer is very quiet and reasonably fast with text: 25 lines of 80 characters took 39 seconds and a screen-dump of text took 35. But a full-page graphics screen dump of a work of "art" took 7 min 15 sec! The graphics screen dump is very crisp but also very slow.

The New Zealand agent, MEC Ltd, of Auckland, normally supplies the Senior Partner with one or two disk drives. A 10Mb hard disk is available for the second drive slot. An expansion chassis will take full-length IBM or after-market boards and a built-in modem is planned. A carry-case will be offered.

Sr Partner comes with MS-DOS 2.11 (with all its utilities) and BASICA (GW-BASIC). In USA, it is sold bundled with WordStar and many other goodies but in New Zealand you'll have to ask your vendor nicely.

However, as far as software goes, need we say more than that this is

## Microcomputer summary

<b>Name:</b>	Panasonic Senior Partner
<b>Manufacturer:</b>	Matsushita
<b>Processor:</b>	16-bit 8088
<b>Clock speed:</b>	4-77Mhz
<b>RAM:</b>	256Kb expandable to 512
<b>ROM:</b>	16Kb
<b>Input/Output:</b>	Keyboard; built-in thermal printer; Centronics port
<b>Display:</b>	80 x 25 green screen; colour RGB port
<b>Operating Systems:</b>	MS-DOS, CPM/86 etc. as for IBM PC
<b>Languages:</b>	As for IBM PC
<b>Graphics:</b>	640 x 200 pixels monochrome; 320 x 200 pixels 16 colours or shades of green
<b>Sound:</b>	Internal speaker
<b>Cost:</b>	\$5995 (includes 256K, 128K of which is an expansion memory card)
<b>Options:</b>	RAM card; Hard disk 10Mb
<b>Reviewer's ratings</b>	(5 the highest): Documentation 4; ease of use 5; language N/A; expansion 3; value for money 5; support 4.

*(Review unit supplied by M.E.C. Ltd, Auckland).*

said to be a PC-compatible? The world is busy writing software for the owners of such machines.

And how compatible is the Senior Partner with the market leader?

Once upon a time, everyone (Panasonic included) was claiming its 8088/MS-DOS computer was IBM-compatible. Most of these turned out and are still turning out to be "80 per cent-compatibles", with the stumbling blocks proving to be the BIOS in ROM and the location and organisation of video memory. An "80 per cent compatible" may be a fine machine but it will not run all the latest and best software — those programs which increasingly make use of direct calls into BIOS and video RAM to get maximum performance out of the hardware.

To reassure you on the software front, Panasonic issues, with the machine, a four-page list in fine print of the PC programs it has found to work. Lotus 1-2-3 runs well.

My own investigations have added several more to this list. For example, the classic test of compatibility, Microsoft's "Flight Simulator", runs faultlessly. Borland's record-shattering "Turbo Pascal" works equally well. Moreover, such demanding programs as the "Norton Utilities" and "Prokey", which make intimate use of the innards of the operating system, seem to work well (although one of Norton's programs, Disklook, seemed to lack some robustness). I am writing this review with Ashton-Tate's marvellous new package, "Framework", and the Senior Partner seems to love it as

much as I do.

I would certainly not guarantee all IBM software will run — but I haven't yet found any that does not!

The Senior Partner also appears to be hardware compatible, except that the case does not quite provide room enough for a full length board. What a foolish mistake! The promised expansion chassis will solve that but who wants to carry an expansion box with a portable? The motherboard comes with 128Kb. One of the two available slots in the machine I am using is holding 384Kb on Panasonic's own board. Why are there no extra goodies like real-time clocks on that board, Panasonic?

Since the machine is being marketed in USA, maybe a range of really neat add-ons will appear. But I wouldn't hold my breath. However, the picture is not gloomy because most desirable features are already in the machine and short boards for the IBM PC do fit. I installed my Microsoft mouse-driver board and presto, instantly the Senior Partner and the "Word" word-processor responded to the desk-top wanderings of my mouse! That's compatibility worth having.

The review machine came with only two plastic-binders (in IBM size but without slip cases), one for DOS and one for BASIC. They are good enough, clearly printed, durable and have adequate indices. The DOS manual could use re-working — it repeats itself in places.

This documentation is good quality but old style. What's the new style? The new style is the interactive computer tutorial (Frame-

# AVM COMPUTERS

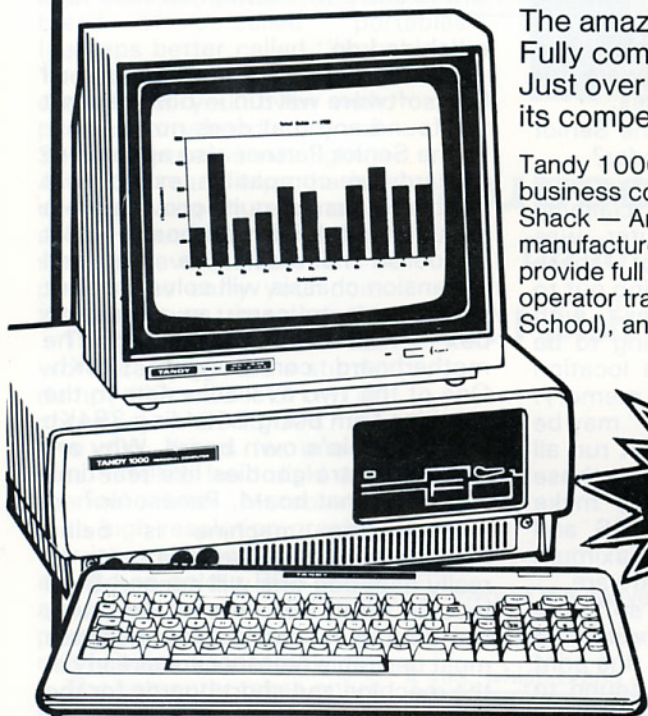
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## HARDWARE REVIEW

work's is superb) which uses the computer to teach the user. Come on Matsushita! Match the fine machine with fine documentation.

The technical manual was not yet available to me. I consider it essential, especially for configuring printer drives.

A reviewer is never satisfied. There are a dozen ways I would like to improve this already fine machine. Many of them apply to the other portables on the market as well. Here they are, in order of desirability:

- Make the case deep enough to accept full-length IBM boards.
- Move the SHIFT keys to where my little pinkies hit! They should be where the ALT and CAPS LOCK keys currently are.

- Panasonic makes very good quad density drives. Install two 720Kb drives and let the user, with a DOS command, decide to degrade them to 360Kb level as and when necessary.

- Move the brightness control to the front. Add a contrast control.

- Provide a volume control (ex factory, so that I don't have to add one.)

- Add a thermal "cut-in" for the fan. Silence is golden and the machine doesn't need its fan in most climates.

- Give the keyboard LEDs to show the status of the NUM, CAPS and SHIFT locks.

- The silly, traditional curly cable with its fiddly plug should become a permanently attached longer cable. Make the keyboard cable retractable, Matsushita! If vacuum cleaners can do it so can you.

- Give the power cord the same treatment. When you give it a tug it could reel serenely inside.

- Move the ON/OFF switch to the front.

- Offer a built-in colour screen as an option. More and more modern software makes good use of colour.

- Redesign the case to be its own weather-proof shield. An optional carry case for a portable is a pain in the neck. In "closed" mode, all the ventilation ports should be water tight and the keyboard should seal hermetically to the body.

These "wish list" faults are trivial. This machine is great value. It seems to have all the power and the software compatibility of the market leader at a most competitive price. And when you consider the benefits of a portable with a built-in printer as standard, plus the options of a hard disk and 512Kb, then the scales tip decidedly in favour of the Sr Partner. Highly recommended.

# FOUNTAIN *User* NEWS



## **MORE NEW \$9.95 TITLES SOFTWARE HIT LIST GAMES CREATOR**

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Volume 1 — Issue 4

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## This month we have something for everyone!

There are three new titles for the COMMODORE 64 and we look at a new flight simulator from U.S. GOLD which is due soon.

We also look at three titles for the COMMODORE 16 and the PLUS/4 and we talk about a chess game for the VIC-20.

## COMMODORE 64 New from MASTERTRONICS are three cassettes in the best gaming tradition



★ **MAGIC CARPET.** You are Alladin and on a quest of honour: to retrieve the treasure stolen from your family by the evil sultan Abdulla. With the aid of your magic carpet you locate Abdulla's palace on top of a dark mountain. You learn that the treasure is hidden in the depths of the mountain through caves guarded by deathtraps and demons. During the journey beware of falling boulders, acid rain, spears of death, moving floors and the teleportation chamber that will zoom you to the cave of bats where one bite is deadly! Can you be the hero that fights through to the cavern of treasure guarded by fire spitting dragons!! **MAGIC CARPET** is a fast action, multi screen game from MASTERTRONICS at \$9.95 (Rec. Retail).



★ **DARK STAR.** You are a skyeagle of the Jupiton fleet on a suicide mission to destroy the Dark Star once and for all. The Dark Star, a spaceship the size of a planet, spreads terror and death throughout the galaxies. Its only weak spot is the central thermonuclear core. You must reach this and with accurate aim explode it with your neutron booster rockets. Many skyeagles have tried and died in the attempt! You must be ultra quick to dodge the numerous projections in your flight path. Keep an eye on the enemy's protector ships as they try to blast you! Will you go on record as another skyeagle that tried but failed to destroy the Dark Star?? A game of fast action and multi-levels from MASTERTRONICS at \$9.95 (Rec. Retail).



★ **More Adventures of BIG MAC — The Maintenance Man.** The mission for Agent 007 3/4, Code Name Big Mac, is to shut down the enemy power station! Intelligence says that there are 18 power vaults, in which are the switches which must be turned off! He must also avoid the internal security system!! Once **BIG MAC** has broken through the enemy security system, the air supply is automatically switched off!! Can he complete his mission before he runs out of air?? **BIG MAC** from MASTERTRONICS at \$9.95 (Rec. Retail).

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## COMMODORE 16 & PLUS/4

Software currently available for the COMMODORE 16 and the PLUS/4 include the following:



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5. Gorf (cart)

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1. Beach Head (cass)
2. Bruce Lee (cass)
3. Raid Over Moscow (cass)
4. Arabian Nights (cass)
5. Ceasar's Travels (cass)

As more titles become available we will also have a C16/Plus4 best sellers list.

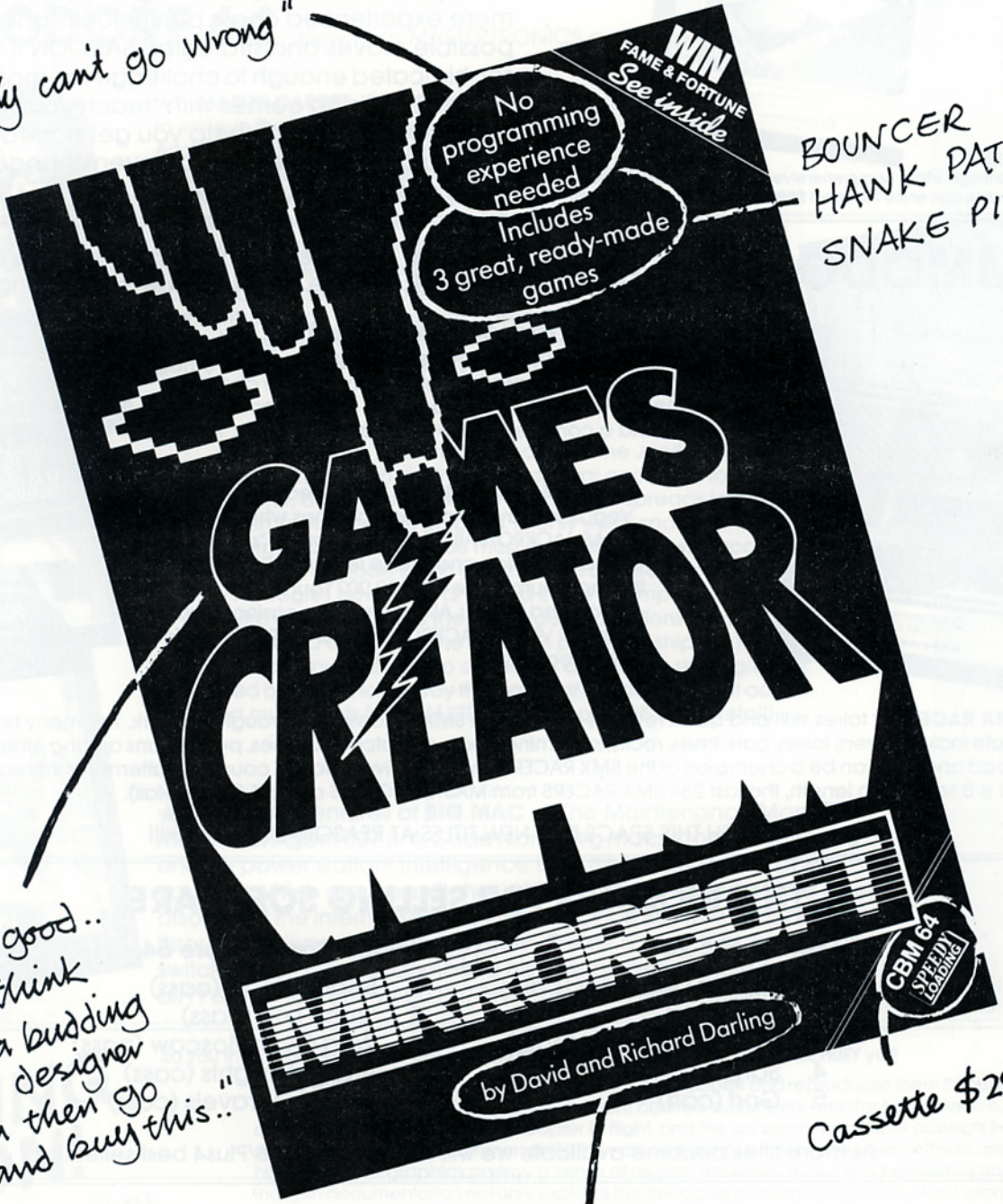
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"You really can't go wrong"

CCI Magazine,  
November 1984



BOUNCER  
HAWK PATROL  
SNAKE PIT

".. very good..  
If you think  
there's a budding  
games designer  
in you then go  
out and buy this.."

Personal Computer News, 10 November 1984

Cassette \$29.95

"Programmers of the year"

CCI Magazine, December 1984

## NEC APC III

## Trappings of a winner

By Gordon Findlay

Personality advertising isn't new in the computer industry. Ronnie Barker, Bill Cosby, Laker (of airline fame) and of course the Little Tramp are among the many who have lent their names and faces to one computer or another. The NEC APC III is the first that I'm aware of anyway to use an All Black in its advertising campaign. Indeed the whole promotion, through print and electronic media has been based around an endorsement by Andy Haden.

The aim: to emphasise the claimed very accessible nature of the machine, and its advanced word processing capability — Andy Haden is, after all, a professional writer. How does the machine rate? To find out, I spent nearly a month putting an APC III, with a variety of software, through its paces. Here's what I found.

The APC III is an MS-DOS machine, based on an 8086 processor, running at a fast 8 MHz. Appearance is relatively standard, nothing like the earlier APC. The main unit houses processor, memory, disk drives and all the usual electronics; the monitor sits on top, and a detachable keyboard completes the picture.

Hardware set-up is the easiest of any computer I have set up — and I've put together a few. There is absolutely no possibility of confusion, as all the leads will fit in only one place, and one way round. So easy was the set-up, and so well described in the Owners Guide, that after I had checked out the system, I unplugged and separated everything and had a novice, who had never had any part of setting up a computer, repeat the exercise. She had no trouble at all, and commented on the simplicity of the task. She is not yet 12.

The main unit houses the processor, with provision for an 8087 co-processor if desired. The main board contains 128K of RAM, and expansion boards can be added up to 640K. The unit I had was equipped with 384K. Most MS-DOS systems now are supplied with 256K as standard; and many programs required that much as a minimum.

The main unit has, on the front, only a rest switch, recessed to



The NEC APC III

prevent accidents, and a power indicator. All the other plugs and so on are round the back. The cooling fan, together with the hard drive made some noise — quite noticeable in a quiet environment, but not too much for an office. Round the back, we find a Centronics parallel printer interface, sockets for both monochrome and colour monitors, and a socket for the keyboard cable. There is also a power receptacle, so that the monitor can be powered from the main unit. A plastic clip-on screen effectively controls the cables behind the machine.

Inside the main unit are 32K of ROM (from bootstrap, basic input and output and self-test), ports for floppy and hard disk drives, a clock-calendar and 64K of RAM for monochrome text and graphics display. A colour board must be installed for a colour display. This includes a separate 128K of RAM for the high-resolution graphics display

(more of that later). This board uses its own slot on the motherboard, leaving the four expansion slots free. These slots are accessible from the rear of the machine by removing small metal plates, thereby avoiding removal of the cover or even unplugging a cable.

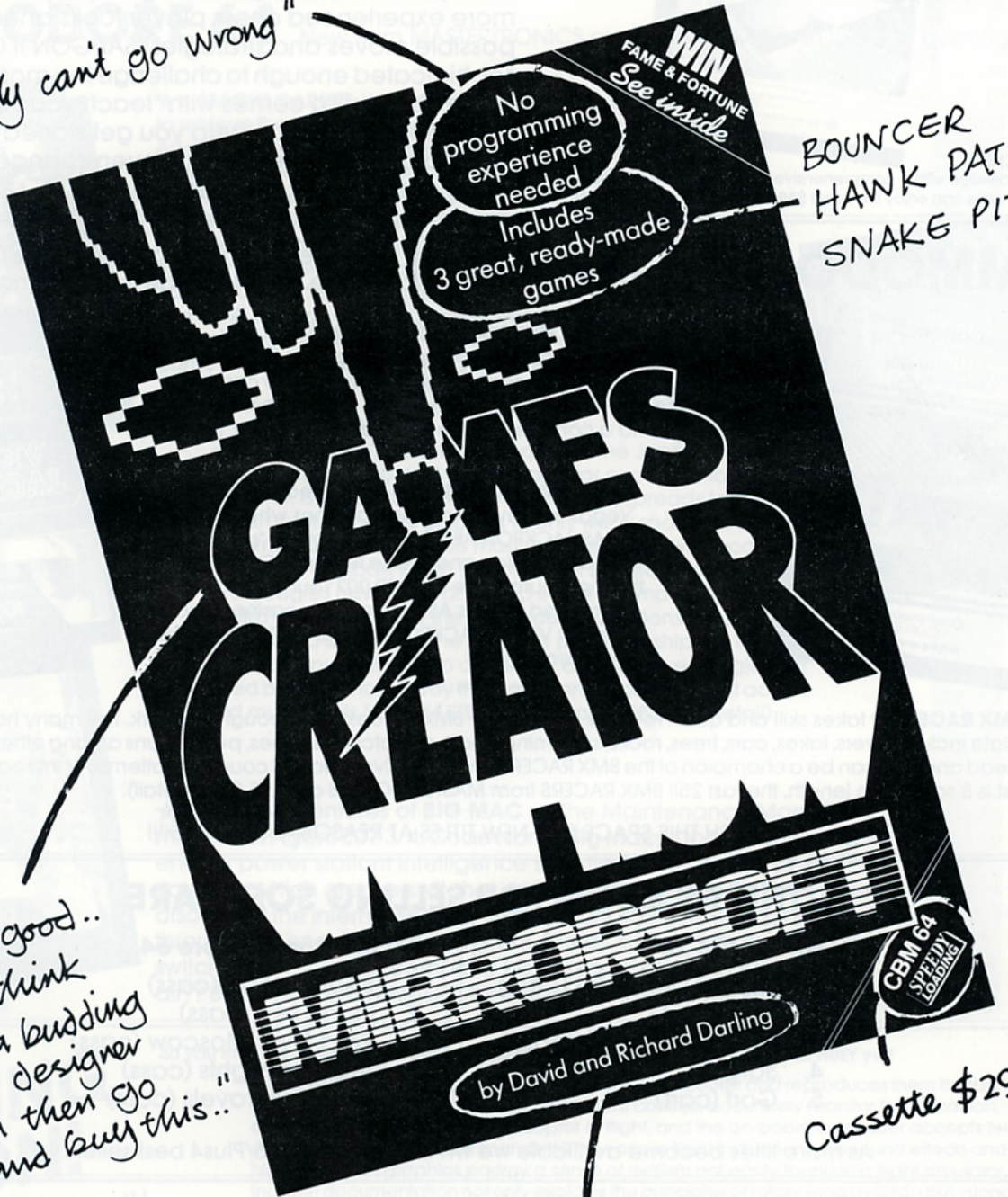
### The disk drives

The APC III comes with various disk drives. The floppy drives have a formatted capacity of 640K Byte, and the machine may be equipped with one or two. Quite what use a machine like this is with one drive I can't imagine — certainly MS-DOS is most unco-operative about disk swapping in the middle of operations. The unit I tested had a 10 megabyte hard drive as well as one floppy, and this made a very effective configuration. The floppy drives are quad density, 96 tracks

# GAMES WITHOUT END..

"You really can't go wrong"

CCI Magazine,  
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BOUNCER  
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SNAKE PIT

".. very good..  
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in you then go  
out and buy this.."

Personal Computer News, 10 November 1984

"Programmers of the year"

Cassette \$29.95

CCI Magazine, December 1984



# HARDWARE REVIEW

per inch and double sided.

The serial (RS-232) interface is programmable at baud rates up to 9600. With a sufficient complement of memory, a partition may be established to set up a "RAM-disk", or region of memory which is treated just like an additional drive (drive E:). Naturally, this is very fast. A supplied utility provides for setting up a 128K, 256K, 384K or 256K RAM-disk; the set-up doesn't take effect until the next reboot.

The keyboard is among the best around. There are 102 keys, including a numeric pad, and 12 programmable keys. Each is programmable five ways by the addition of various shift and similar keys. A slot is provided for a template labelling them. The keys make sufficient mechanical noise that I didn't want to add the electronic "keyclick" which may be turned on.

Naturally, many of the special keys, such as "INS", "PG UP", and "HELP" will function only if the software looks for them, and not all the software did. The keyboard will generate many graphics characters by using one of the two locking "graphics shift" keys. Neither these nor the "caps lock" key have indicators, which I found a minor annoyance.

The display is a very strong feature of this computer. The colour monitor is a direct RGB type, which provided

## Microcomputer summary

<b>Name:</b>	NEC APC III (Advanced Personal Computer).
<b>Manufacturer:</b>	NEC Corporation, Tokyo.
<b>Microprocessor:</b>	8086 true 16-bit.
<b>Clock speed:</b>	8MHz
<b>Memory:</b>	RAM 128K, expandable to 640K (excluding screen RAM); ROM 32K.
<b>Input/Output:</b>	RS-232, RGB video, monochrome video, parallel printer, joysticks, mouse, disk drives.
<b>Keyboard:</b>	102 key, 12 programmable, numeric pad, cursor control.
<b>Display:</b>	25 x 80 or 40.
<b>Graphics:</b>	640 x 400, 8 colour (requires colour board fitted) or monochrome (standard).
<b>VDU:</b>	Monochrome or RGB — see text.
<b>Languages:</b>	GW-BASIC and Turbo Pascal tested; others under MS-DOS.
<b>Sound:</b>	inbuilt speaker; optional music board.
<b>Cost:</b>	(i) with 128K RAM, two floppy drives, monochrome monitor printer cable and MS-DOS, \$6742 (tax paid). (2) with 256K RAM, 1 floppy drive, 1 10 megabyte hard drive, monochrome monitor, printer cable and MS-DOS \$9811 (tax paid), (3) Memory expansion: 128K \$813; 256K \$1153. Hard drive (internal) upgrade \$3391; colour graphics board \$483. GW-BASIC \$163; Turbo Pascal \$190.
<b>Reviewer's ratings:</b>	(5 the highest): Ease of use 5; documentation 4-; languages 5; expansion 5; value for money 5.

(Review unit supplied by Scollay Computers Ltd, Wellington).

excellent text and graphics quality. This really was extremely good, allowing the use of colour for text display without loss of readability at all. Text display may be in 80 or 40-column mode; with 25 lines. Graphics resolution is 640 by 400 with eight vivid colours.

This monitor is expensive (\$2351 including sales tax), but worth it. The monochrome monitor, also 14in diagonal, looks cheap at \$1018 — as you'd expect at that price, the quality is exceptional. There are 192 special characters available in text mode, including foreign alphabets, mathematical symbols, lines, blocks and others.

The operating system is, naturally, MS-DOS, although an expansion board with a version of UNIX is soon to be available. Several custom utilities are provided. These include utilities to set and display file attributes; set the default screen colour to white or green (on a colour monitor naturally); dump the screen display to a graphics printer; compare contents of disk drives; save programmable function key definitions; turn a key click on or off; establish a RAM:disk; handle a mouse (none was supplied); set up the printer port and set up the serial interface.

Documentation supplied is a brief "Owners Guide", and the standard MS-DOS manuals, with NEC

## Exceptional guide

supplements. The Owners Guide is exceptional — clear, well printed in full colour, with excellent instructions and superb illustrations. The rest aren't so spectacular, documenting the architecture of the machine and the custom utilities in a fairly technical way. One major omission was noted: there was nothing in the manuals I've seen about the hard disk drive set-up or its care and feeding.

When the machine is turned on, it performs a self-test, which with 384K or RAM installed took 35 seconds. The speed of the machine has been a major point in its advertising. This machine is very fast. I replicated several published benchmarks, in both BASIC and Pascal, and generally obtained times for computation only of around one third of those published for the IBM PC.

I couldn't find suitable comparison times for disk access, but the floppy access times seem reasonable (for floppies — the hard disk is naturally very fast). Because of the way in which the video controller interacts with the main processor, the screen changes at the same time as the processor writes to video memory — this makes screen writing and updating very fast. So yes, it's a fast



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## New Books from Sybex due shortly

### The Macintosh Basic Hand Book

By Thomas Blackadar and Jonathan Kamin \$89.95

The complete chair-side reference guide for daily use by all Macintosh users interested in BASIC programming.

Its A-to-Z collection of 300 entries describes every Macintosh BASIC command word.

This book includes full details of previously undocumented Macintosh graphics and TOOLBOX command words— words that can be used as powerful extensions of Macintosh BASIC.

### Multiplan on the Commodore 64

By Richard Allen King and Stanley R. Trost \$55.95

Designed for business professionals, this book explains how to use Multiplan™ for forecasting, planning, and control in actual business situations.

It explains the technique and illustrates a score of accounting and management models that can be used immediately—from financial statements to master budgets.

This book will guide you all the way to advanced level of skill with Multiplan, allowing you to master quickly and conveniently all the features of this powerful spreadsheet.

### Advanced Techniques in dBase II

By Alan Simpson \$79.95

Alan Simpson, SYBEX best-selling author of Understanding dBase II, takes you through a highly structured tutorial of advanced programming techniques. The book includes: software design skills: techniques for maximum performance: fundamental algorithms and business systems.

### Programming the 68000

By Steve Williams \$76.50

This self-contained tutorial will take you through all the necessary steps from understanding what assembly language programming is, through a mastery of such advanced techniques as exception or interrupt programming, and interfacing with higher level languages and operating systems.

### Advanced Business Models with 1-2-3

By Stanley R. Trost \$62.50

You can use this book in two ways: first, to meet your essential business needs with spreadsheets, and second, to follow the detailed explanations that show you how to create your own advanced 1-2-3 models.

### Personal Computers & Special Needs

By Frank G. Bowe \$34.95

Personal Computers and Special Needs shows you the many practical wonders these marvelous machines can work for those who are confined to a bed or wheelchair, or have difficulties with vision, hearing or learning. Today's personal computers can "hear" for deaf people, "see" for blind people, "move" for people with mobility restraints, and simply make life easier, safer, and more rewarding for the elderly and handicapped. Written in plain English, this informative guide explains how computers can be used in many situations involving special needs.

**These books will be available shortly from all outlets where computer books are sold**

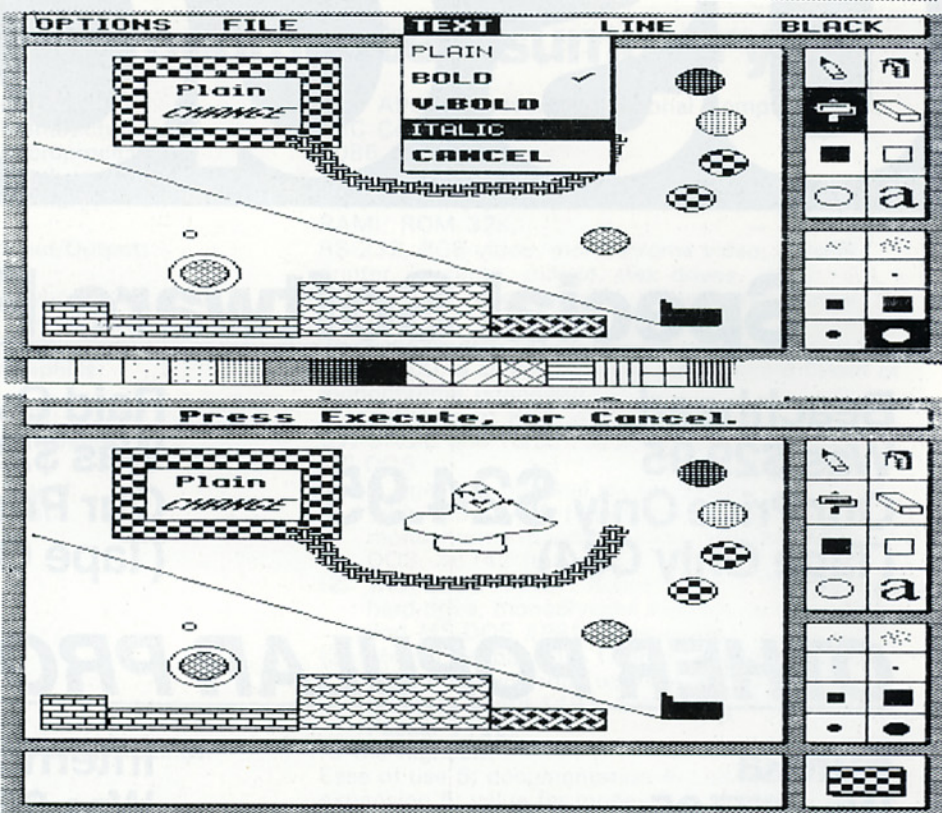
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## HARDWARE REVIEW



The MX-ART screen. Note the drawing area and icons for choice to the right of the screen.

One pull down menu in use: options for text. Note the pattern fill (paint roller) is currently selected choice.

machine.

The question of IBM compatibility is always raised for any 8086 or 8088-based machine. For the APC, compatibility with the IBM PC is limited. The NEC will read an IBM-format diskette; but compatibility is limited by the different locations of video RAM, and different entry points to the ROM BASIC input-output routines. The only IBM software which is likely to run is that which uses only ANSI display driver sequences — and not much does.

This compatibility problem may not arise in practice. NEC has enlisted a lot of software houses, and specially configured versions of most of the big-name software packages are available. These include the major language packages GW-BASIC and Turbo Pascal, as well as such well known names as WordStar, SuperCalc, Multiplan, the PFS series, Friday!, DR-graph, DR-draw, dBASE II and others. Lack of software should not be a problem.

Service locally is through Scollay Computers and Tisco. The standard warranty period is six months.

During the time I had the review unit, I tried many well known packages which I have used on other machines. The only criticisms were those already mentioned, and the

system was very impressive. This machine is squarely targetted at the sophisticated business user, who can make use of the super graphics, and high speed. It is superior to many products in its class, and the prices are reasonable. I expect a good response in the marketplace.

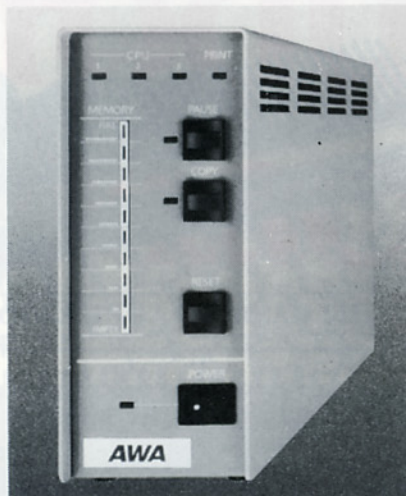
## EFT-POS

Claude Remy, Paris-based banking industry partner of the international accounting firm of Arthur Andersen, has been visiting New Zealand to talk about the economics of EFT-POS (Electronic Funds Transfer at the Point of Sale). Brought here by Burroughs Computers Ltd, he addressed the Retailers' Federation annual conference in Wellington and also spoke at a series of retailers' seminars in Wellington, Christchurch, Hamilton and Auckland.

Mr Remy has been closely involved with EFT-POS in Europe, and he and his team are assisting financial institutions in reviewing the introduction of new technologies like EFT-POS.

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### COMMODORE PLUS 4

# An attractive new model

By Peter Ensor

With Commodore leading the home computer market with the model 64, it was interesting to review its latest release onto the New Zealand market, the Commodore Plus 4.

Aimed at the type of user now using the C64 for small business work, as well as the domestic market, it has 64K of RAM, similar to the 64. But the new machine has 60K available to the user compared with little over half this for the 64.

The most striking difference between this machine and previous models is the totally new shape. Cooling fins are predominant along the rear edge of the unit, with the case made from a dark grey plastic with bone coloured keys.

In the bottom right hand corner of the keyboard are the four cursor control keys — very distinctively shaped as four arrows pointing in each of the possible directions.

There are four function keys available, placed along the top of the keyboard. Each may be "shifted" to obtain a second function. They are already programmed with useful operating system commands but may be reprogrammed by the user to contain any string up to 128 characters long. For example, the fourth function key is programmed with a help command. This command highlights syntax errors encountered in a line of the program.

### Turnaround

Turning the unit around exposes the sockets at the back. Commodore has taken the opportunity, while changing the case design, to change the sockets used for some of the peripherals. New plugs are required for the power supply, the joysticks and the datasette. However, adapters are available to enable old style joysticks and datasettes to be used.

The serial port and the video ports are the same, allowing use to be made of most of the existing peripheral range. The only other two sockets available are those for the memory expansion and a user interface port. This user interface port is able to be programmed for use as a serial RS232 port. On the side of the unit is the socket for the TV connector, the off/on switch and the reset button.



*The Commodore Plus 4*

The RS232 port, while called such, does not contain the true RS232 levels. It will work with some RS232 devices, but a Commodore RS232 interface cartridge is required to change the 0 to 5 volt levels to the required +12 and -12 volt levels. Otherwise, the format of the signal is correct.

When first turned on, the screen shows the familiar bordered picture with a sign-on message reminding you of the name of the machine and the amount of memory available. Pushing the first function key will get you entry into one of the software packages supplied. These are discussed later.

The BASIC is good, with more than 75 commands available, including Paint, Trace, Trap, Do/Loop/While, and a command to save shapes off the screen to the disk for recall later.

Disk drive operations have been simplified from the old 64, with commands such as DLOAD to load information off the disk. Error messages are available in a string for program error trapping.

The resolution of the display is 320 by 200 pixels and a choice of 121 colours made up from 15 primary colours, with each colour having eight luminance or brightness levels, as well as black.

### Disappointing

A built-in sound generator is capable of a span of four octaves from two voices. This feature is disappointing, considering what is available from other machines, including those in the Commodore range. Only people specifically using the sound generator for music or games will notice the missing voice(s).

The unit contains a 6502 monitor for machine language programming. This has a good range of commands but would benefit from the addition of a single step facility.

The Plus 4 name refers to the four in-built software packages — a word processing package, a spreadsheet, a database and a business graphics package.

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**Everywhere you go there's a Commodore.**

# HARDWARE REVIEW

The business graphics package was disappointing — it turned out to be what is usually supplied as the graph drawing command of a standard spreadsheet package. It plotted the values of a column of the spreadsheet onto the screen using characters rather than a high resolution graph. The reasoning is that the low resolution is required if the graph is going to be dumped onto a printer — not many of the less expensive printers can produce high

resolution printouts.

All the other packages had a good selection of commands. It would appear Commodore has chosen not to use the disk drive to buffer information on the disk. This limits the size of information with which each of the packages can deal. Despite this however, each of these packages is certainly worth having.

depending on the results of other calculations.

The database, or file manager, has a limit of 999 records, each with a maximum of 17 items of information, and each item containing a maximum of 38 characters. Information may be selectively retrieved according to upper and lower limits and sorted into order using a maximum of three fields.

Information is printed using commands entered into the word processing document. The form of the printout of the data is entirely defined by the user. By incorporating these commands a document, for example, a letter may be sent only to your customers in Westport describing your new product, and each letter would contain the customer's full address in the address block.

As yet, there has been little mention of the future sources of games software. The Plus 4 can run all the C16 software and there are versions of Superbase and Scriptplus available. It is rumoured that overseas software houses are going to be bringing out titles, and more than 40 titles are already available. In addition, four disks of public domain software are available.

The three main packages supplied and the BASIC are the main tools likely to be required on a computer and to have them supplied in the computer is going to make this model very attractive to a potential customer. The unit, supported by good documentation, is likely to appeal to the small business or sports club as well as the avid games player.

## ICL videotex

Agreement has been reached for ICL Computers to supply videotex systems to the Travel Agents Association of New Zealand.

ICL will set up and operate a substantial database for the travel industry's videotex service. The service will be called Taaris (Travel Agents Association Reservation and Information Service) and will operate on an ICL VME-based 2900 mainframe computer using Bulletin, ICL's proprietary videotex system.

Taaris will offer comprehensive message switching and eventually build up to tour and airline booking and reservation systems.

## Colour terminal

Wyce has introduced a new colour terminal which can be plugged into existing hardware without making software changes. The WY-350 has been designed to use colour to distinguish the highlighting and variations of a WY-50 monochrome screen.

The terminal has 64 colours in 16 colour palettes which are selected by holding down the control and shiftkeys together and pressing a key on the numeric keypad.

## Framework/dBASE III

Framework and dBase III are now available on 3½ in diskettes for use on the Data General/One portable PC.

Both software packages operate in the MS-DOS environment and will be available through Data General's dealers and direct sales channels who also distribute dBASE II and Friday! software. There are presently more than 150 third party software application packages available for the DG One on 3½ in disks.

## Word processing

Consider the word processing package. The maximum document that can be edited is 99 lines of 77 columns per line. If you want to edit larger documents, a set of smaller files may be linked together when printing. There are commands to deal with blocks of text, search and replace items of text, change the margins and page size as well as automatic page numbering and justifying of text.

It would have been an advantage to see on the screen just how the page would print out. When the text is entered into the computer, some of the words have letters of the same word split between two lines. The words are rejoined when the document is printed.

With the spreadsheet, the data is again limited to 50 rows by 17 columns. Data can be moved from the spreadsheet to the word processor and be incorporated in a report.

A reasonable selection of trig functions is available, as well as some commands to specify the format of spreadsheet. The spreadsheet also has the ability to change the contents of the cells

## Microcomputer summary

<b>Name:</b>	Plus 4.
<b>Manufacturer:</b>	Commodore.
<b>Microprocessor:</b>	6502 equivalent.
<b>RAM:</b>	64K with 60K of user RAM.
<b>ROM:</b>	32K including BASIC and operating system.
<b>Input/output:</b>	Two joystick ports, datasette port, composite video and TV outputs, serial interface, memory expansion.
<b>Keyboard:</b>	QWERTY with four user programmable function keys and cursor control keys.
<b>Language:</b>	BASIC, LOGO available.
<b>Graphics:</b>	320 by 200 pixels in 121 colours.
<b>Sound:</b>	Four octaves from two voices.
<b>Cost:</b>	\$895.
<b>Peripherals:</b>	Most of the existing Commodore range but requires a special datasette. Adaptors are required for the datasette and joysticks.
<b>Other features:</b>	Assembler, spreadsheet, word processor and database manager included in ROM.

Reviewer's ratings (1 to 5, 5 the highest):

Documentation 4; ease of use 5; language 4; expansion 4; value for money 4; support 4.

(Review unit supplied by Commodore Computer (NZ) Ltd).

# ICL status

By Pat Churchill

ICL has introduced Status — a package that makes searching large document databases much easier — in New Zealand.

There has been an explosion in electronic publishing with business records, technical manuals and even the Encyclopaedia Britannica now available in electronic form.

Status gives easy access to large amounts of unformatted text held on any ICL mainframe computer.

Information is stored in a Status database in documents which can range from a single paragraph to a report covering many pages. Every word or phrase can be used as a key for selection.

For instance, if a database held details of the last 10 years' newspapers, a user could ask Status to find every reference to a particular word or phrase — consumer price index, for example. The system would then tell the user how many documents containing consumer price index it had found. Titles and reference numbers of relevant

documents could be displayed in order to select those required for reading or printing.

Status also allows for selective searching of the database — for instance, to identify people born after a certain date. It is also possible to search for words sharing a common root and to build a synonym list so that a selection such as "car" will also find "automobile", "saloon" and "Datsun".

The use of macros enables often-repeated searches of the database to be called up via a simple menu system, with the minimum of typing. (Macros are sets of complicated commands tied together in one package and given a simple name.)

Ordinary text can be entered into Status from ICL's word processing systems. Cataloguing and cross referencing is automatically carried out.

Australia's Hansard record of debates in the Federal Parliament is held in a Status database.

## Altos advances

Altos is quietly forging a place for itself in the New Zealand market in spite of problems experienced here under its previous agents.

Chase Computers has sold 60 systems in New Zealand since taking on the agency with the local government and retail travel agent markets taking about 50% of the total sold and the balance going into the general business market.

More than 400 Altos machines are now installed around New Zealand and national sales manager Graeme Lodge expects this to increase considerably with new moves to be announced later this month. He hints that these will be in both the software and hardware areas and will be announced by Altos' director of international sales, Sandy Holt, when he comes here later this month.

Holt has praised Chase's performance with Altos and says it has become one of the top worldwide distributors.

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# Identifying a problem

Auckland Hospital has installed an MDL microcomputer system to process some 2,500,000 identification labels each year.

The micro and printers replace a dedicated label printer and provide a system for capturing complete in-patient information.

Rod Kennedy, principal technologist at the hospital, has developed the system to cover patient admissions, waiting lists and a range of other services, operating constantly.

He said savings of \$28,000 were achieved in the first year of the system and the computer had already paid for itself.

He said savings of \$28,000 were achieved in the first year of the system and the computer had already paid for itself.

"The system has been developed in a very cost-effective way and our on-going costs are minimal." Further opportunities for the system, including full records of the outpatients department are being planned.



At the computer suite at Auckland Hospital: MDL's sales manager, Paul Monks, (left), Rod Kennedy, and computer operator Michele Bones.

The hardware includes an MX 20 processor with dual 8in floppy disk drives, one 18 megabyte Winchester disk, seven VDUs seven dot matrix printers, and an XY plotter.

The system uses a TurboDOS operating system and dBASE II application software and changes have been made to enable dBASE II to issue "lock" commands.

The system is menu driven and patient records are held while the patients are in hospital, booked for admission or on a waiting list. On discharge from hospital the patients' records are removed from the computer.

Information is easily generated for other departments and a daily

census is compiled for up-to-date assessment of the hospital's bed status and other data.

## Airwaves

Radio New Zealand and Dick Smith Electronics Ltd have joined forces in a telesoftware venture — believed to be the first of its type in commercial radio in the southern hemisphere.

The system which has been used in the Netherlands, basically means that computer programs will be freely available cassette to cassette via the airwaves.

Wait for it though . . . never one to move too quickly, Radio New Zealand might have scored a first in making the programs available via the airwaves — but you'll need to be a night owl or an early bird to appreciate the big moment when the audio tones hit the air — 3.30 a.m. Wednesday mornings!

Dick Smith is being a real sport though, and is awarding \$100 each week for the winning entry as well as two overall prizes for the Computer Educator of the Year, aimed at encouraging computer education. The winner receives \$2000 cash and \$3000 equipment with an overall weekly prize to be awarded in this category as well.

The whole scheme is part of RNZ's move to establish a computer club via the Tonight Show. The programmes will be broadcast on the ZM stations on Monday and Tuesday evenings.



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# Receivers appointed

Receivers have been appointed to the New Zealand offices of Anderson Digital Equipment Ltd — hot on the heels of a similar move at the company's head office in Australia.

The New Zealand receiver was appointed by UDC Finance Ltd, debenture holders, and while it will be a few more weeks before the company's position is clarified publicly, the company is continuing to trade in New Zealand.

ADE bought David Reid Data

Products more than 18 months ago and made a strong play at pitching the New Zealand developed and manufactured Q Mini computer onto the Australasian market, promoting its ability to service and support the product.

New Zealand general manager N. Misra resigned in March and John Hutchinson, appointed sales manager last November, has been appointed to the general manager's hot seat while the company's future,

if any, is rationalised.

ADE has carried a number of senior agencies in the computer products field, including OKI printers, Diablo, Qume, Mannesman Tally, Quadram, Texas Instruments, DEC, Northstar, IDS Prism, Florida Data, Fujitsu, Televideo, Houston Instruments and a host of other peripherals.

Hutchinson says the future of the agencies is in the hands of the suppliers, most of whom are unsecured creditors. "A massive injection of finance would be needed to stabilise the situation although it (the situation) will be improved considerably when our collections are made. We are still trading and for those who are prepared to take the gamble we still have product here."

He said products were not being sold without warranty although it is difficult to make promises for service backup when the company's future is so unsure.

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# Lesson in privacy

Ethics of copyright and data privacy should be taught in schools and the computer industry should develop and promote a code of ethics to safeguard the public's 'electronic privacy'.

Speaking at the National Pharmacy Conference in Rotorua, Databank's chief executive officer, Gordon Hogg advocated a strong lead be taken by the information technology industry in the debate over privacy legislation. He said Australia and New Zealand lag behind the rest of the world in this respect and international pressure was being brought to bear for change.

There were no practical, legal controls in New Zealand over collation, storage and dissemination of personal information, he said. Nor did there appear to be any legal obligation on database holders to disclose to people details of personal information held about them. Nor are they obliged to disclose to whom that information has been given.

"As long as the information collected is accurate, litigation against the collector is probably not possible. But, how would one know?"

More electronic safeguards needed to be developed and people need to be educated on using them

The public should be made aware of the relative risks of storing information in electronic and non-electronic environments, he said.

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# A graphics database manager

By Pip Forer

When the Macintosh arrived on the computing scene, its first two software offerings (MacWrite and MacPaint) were tailored to stress the capabilities of its proprietary operating system, particularly its handling of text and graphics. As Macintosh users will know, MacWrite is a middle-range word-processor distinguished largely by its realisation of the "what you see is what you get" concept and by its ability to incorporate graphic (or diagrammatic) material into documents. MacPaint is a composite of all the best "screen sketcher" programs in general use, plus some extensions, neatly dovetailed into the Macintosh environment.

As software houses geared up to produce for the Macintosh, one area of interest was the degree to which released software would use the Mac's unique environment. Many early offerings were translations of software available on other machines. In some cases, the Macintosh version simply polished existing releases or just integrated the product into the standard Macintosh operating "shell".

"Transylvania", brought across from the Apple II, is an example of the latter where a faster, smoother but essentially unaltered product is offered. The Multiplan spreadsheet is a more complete assimilation where the use of the mouse significantly enhances the speed and ease of use of a spreadsheet structure and syntax already popular on other machines. The language development environments also appear to offer significant benefits from use of the Mac environment, while at the same time remaining essentially outgrowths of standard languages.

The really interesting developments however are designed to offer new ways of working with common problems. The Apple products, MacProject and MacDraw, are two examples of trying to use the Mac interface to significantly enhance the ease of handling complex management and design problems. At the time of writing, these products are not finally released but a product which is out and deserves

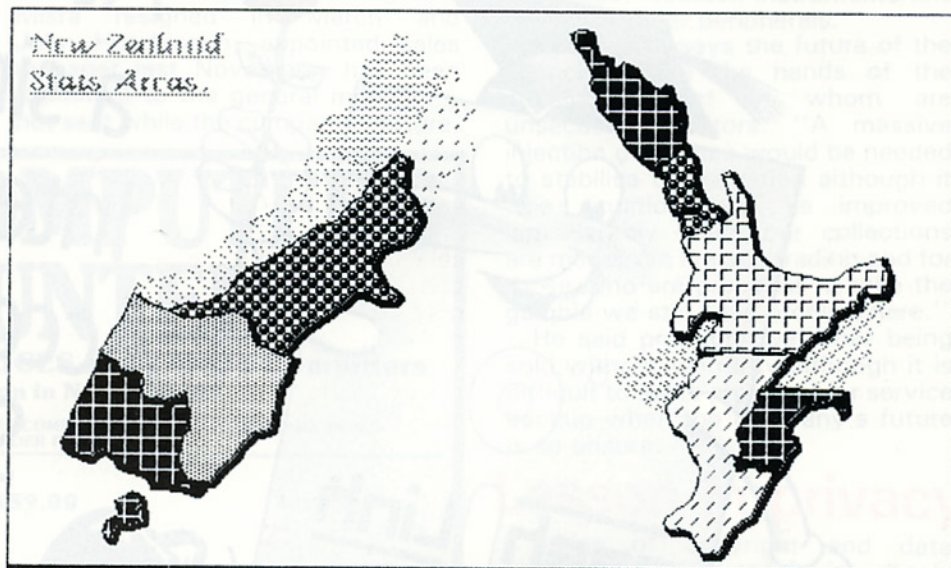


Figure 1

mention for its similar attempt to capitalise on the Mac's facilities is FileVision.

FileVision is essentially a database manager, but with a graphics component. Like any database, FileVision has a series of discrete records — called objects in FileVision's terminology.

Objects can have two parts — a formal part comprised of information which is either numeric or text (the value of an item, the item's manufacturer etc), and a series of graphics elements.

Each object can be viewed for information (the standard material of databases) or by its graphics component (as displayed on the screen). The standard display screen devotes about 80% of its area to showing these graphics components. All records (objects) which fit certain criteria can be selected for highlighting on this screen (they are "highlight" in bold black). You can also select any object to see its formal information just by pointing at its graphic component with the mouse.

It may be useful to look at how FileVision handles these two components of its database before going further, as they show some imaginative use of the Macintosh environment. The information

component is notable mainly for the way the creation of a record is handled. Older database languages often create a form for inputting the fields of a record by using conventions for vertical and horizontal TAB locations on the screen combined with rigid field lengths. This is replaced in FileVision by a screen representing a large page.

The fields of the record can be added to this page, deleted, moved in position or altered in size quite freely using standard Macintosh conventions. A pointing finger will locate a new field; one "handle" on that field can be used to drag the field to a new location and another to shrink or expand the field as required.

Entries into any field of the record are achieved by pointing at the area relating to that field and typing in the relevant contents. This comes as a silky surprise to anyone who has worked in a more conventional, keyboard/straight text driven environment.

The graphic counterpart for each information record can have various forms. At its simplest, this can be a symbol. The program supports 20 symbols, each one a rectangular grid of 16 by 16 dots, and provides a

symbol editor to allow easy creation of custom symbols. A symbol is one graphic "element" and any object can comprise several such elements. These include rectangles, circles/ellipses, irregular lines and shaded areas.

The component elements in an object can be edited and moved individually and the editing facilities are quite comprehensive. They range from the standard s-t-r-e-t-c-h options for areas on the screen through to a most powerful way of modifying freehand outlines using multiple "handles" along the entire length of the line being edited. The facilities are fast, allow easy creation of quite complex shapes and clearly use the "quickdraw" routines in the Mac's ROMs effectively.

Creating both the graphics and information components of an object is quick, easy and pleasant. The metaphor to fit this particular software must be the doodle . . . but this doodling offers very high productivity in what you get done.

There is a further level of complexity in the database. Basically, objects must be assigned to a "type" with up to 12 types in any database. Each type can have a

completely different set of fields and form. Also any object (record) can link to a complete new database, thus allowing a certain amount of hierarchical arrangement of information. The value of this gets discussed later.

What do you use this all for? FileVision lets you search your database looking for objects (records) that satisfy conditions set on up to four different criteria at any time. The criteria are established by the user using another very friendly, mouse-driven interface in which choices are made by use of a mouse-driven menu and converted into English statements of the condition set.

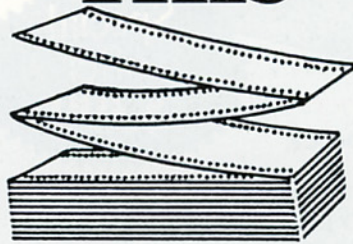
There are limitations on the selection opportunities. The conditions are cumulative (ANDs only, no ORs) and only four can be applied at once. There is no facility for combination of fields arithmetically. This aspect of the program is rudimentary for any significant, traditional database task and needs development. However, once the objects are selected as fitting the criteria, various things can be done with them. They can be flicked through for information in a

fairly standard way or the graphic object relating to any record can be removed and repositioned on the screen.

The graphic display is quite handy just for giving a visual impression of the database and providing an easy way of choosing items on which to get full information. It comes into its own when there is a spatial component to all the objects in a data base. Consider two cases: seating people at a convention, and doing simple mapping.

In the first case, you are a convention manager or a football club secretary. You wish to derive an optimal seating strategy where smokers and non-smokers are separated, men and women are alternated and only two couples from a particular team are seated at the same 12-person table. FileVision would first create a background showing the tables in a banquet hall, then to create a male and female symbol. Each attendee can then be coded as smoker or non-smoker and by team. You then make a stab at a first seating arrangement by placing the graphic element (symbol) for each person at a table. Then you highlight by "smoking". The

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## SOFTWARE REVIEW

symbols can be picked up with the mouse and moved around to separate smokers and non-smokers. Highlighting by each team in turn offers the chance to ensure a fair distribution of team members. New registrants are easily accommodated by adding new records and cancellations can be easily adjusted for. If you put in a field in the record for non-payment of the registration fee, you can even get an immediate map of where your defaulters are sitting and move in on them on the night.

Another example is with mapping.

Each formal record in this case could contain marketing information related to graphic components that mapped a geographical area or location. You could then highlight areas with, say, a high or low population density, numerous ski-fields or a certain number of houses for sale. In figure 1, we have highlighted all statistical areas in New Zealand with a population over 100,000. One use of the link facility mentioned earlier is that we can now offer the user the chance to select any of the "highlit" areas and link to a new data file displaying just that

area. Effectively we can use this to zoom in on a map in more detail.

This could be used effectively for many minor purposes and would be ideal for some application such as a real estate agency wanting a new way to let clients select possible houses from a large listing. It is handicapped by the lack of power in the information handling part of FileVision, particularly the inability to combine fields arithmetically and to make more sophisticated selection choices.

Overall, FileVision offers an interesting product with potential for use in many non-traditional database roles. Its interface to the user is quite delightful and its graphics component a useful start to obvious possible expansion. It cannot be considered a serious database system, in the Dbase III class but this is surely not its designed function.

What it offers is a pleasant and powerful way for handling small data sets where the user is constantly redefining the contents or spatial arrangements of information. I know of many such sets where traditional database systems are overkill or too arcane to use or do not offer the graphic component. FileVision has a niche here and inevitable expansions of the system will mean a growing area of appropriate applications. A friend recently undertook the organisation of seeding for a swimming tournament using FileVision, and another has experimented with handling their regular church donations on it. For them this is appropriate software, workable software and above all, useful software.

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New Zealand's personal computer magazine.

P.O. Box 9870, Newmarket, Auckland.  
Telephone: 549-028, 549-677, 549-658

# NOT ALL FLOPPY DISKS ARE CREATED EQUAL



**maxell**<sup>®</sup>

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**MD2-D**



**maxell**<sup>®</sup>  
OF JAPAN



**SETS A NEW STANDARD  
OF EXCELLENCE.**

# ...AND NOT ALL COMPUTER SUPPLY COMPANIES ARE CREATED EQUAL

*it's time to meet No.1!*

Compumedia Systems Ltd is a specialist computer supplies company. We operate in Australia and New Zealand. We source quality High-Tech products from all over the world.

Add to this a young, professional team of people determined to provide top personal service to their growing list of clients. In computer supplies we really are Number 1!

## **Floppy Disks**

Complete range of quality products for every major brand of disk driven computer and word processing system in New Zealand. Maxell and Verbatim brands. 8", 5¼" and new 3½" microfloppy.

## **Disk Minders/Storage Units**

Dust, light and physical protection for your 'precious' data. Minders with moveable dividers, attractively finished.

## **Computer Tape**

BASF consistent high quality products — 600, 1,200 and 2,400 ft tape performing to highest international standard of 6250 BPI density.

## **Printer Ribbons**

We've sourced the very best range of ribbons in New Zealand. Our PRECISION ribbons are assembled totally from *imported components*. Our people will make sure we match the ribbon exactly to your individual printer.

## **Cleaning Products**

We supply cleaning and maintenance products from U.K. based A.F.L. — leaders in manufacturing quality products for computers and word processors for over 14 years.

'Floppiclene' kits for flexible disk read/write heads — to keep your data error free.

'Foamclene' anti static cleansers — clean external surfaces and reduce static charges.

'Safecleans' for V.D.U. screens.

'Safewipes' and 'Safecloths' for applying cleaners.

'Sprayduster' aerosol for cleaning delicate and inaccessible parts of computer hardware.

## **Computer Paper**

Standard sizes of Gold Bar and word processing (Smooth-Edge). Smaller, convenient packs of 500 and 1,000.

## **Acoustic Printer Hoods**

Make your office environment more comfortable. Our new hoods are lightweight, efficient and affordable.

## **PRECISION Anti Glare Filters**

Effectively combat eyestrain and fatigue. Filters absorb reflected and stray light and create a sharper, softer image.

## **Attractive, practical Computer Furniture**

Our range is growing all the time. We have furniture for your computer and printer finished in long life, scratch resistant 'Melteca'.

**SEE US AT THE SHOW:**

The logo for Compumedia Systems, featuring a stylized 'C' symbol to the left of the company name.

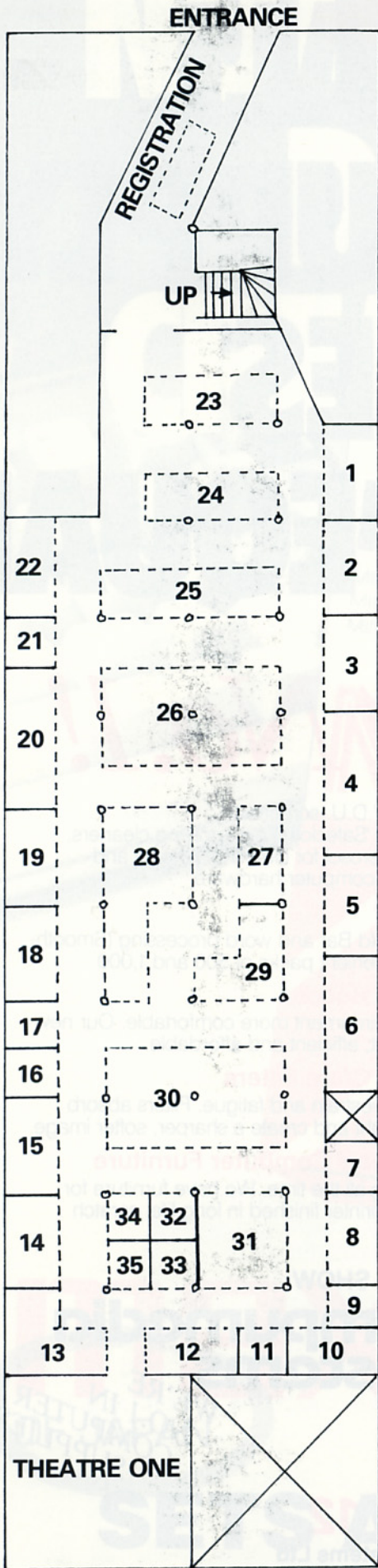
**WE'RE  
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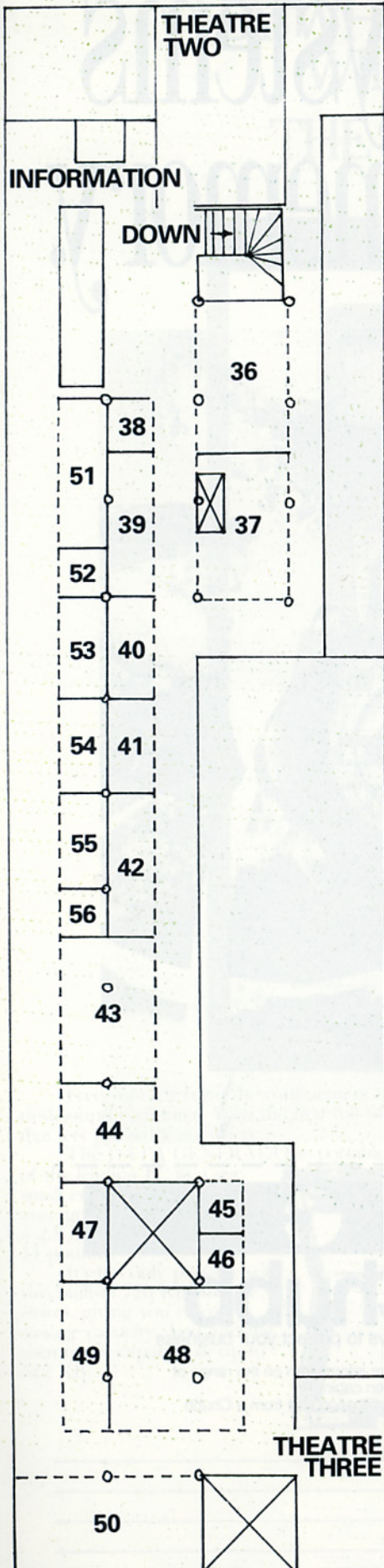
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# FLOOR PLANS GROUND FLOOR



- |                            |                               |
|----------------------------|-------------------------------|
| 1. David Reid              | 24. Computer NOW              |
| 2. Computer World          | 25. Commodore                 |
| 3. Hitec Micro             | 26. PAXUS                     |
| 4. Imagineering            | Framework Information Systems |
| 5. Genisis Systems         | IDAPS                         |
| 6. Data Peripherals        | Southmark                     |
| 7. Silkwood                | Interactive Applications      |
| 8. Archives Computers      | 27. ICL                       |
| 9. University Bookshop     | 28. Barsons                   |
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| 11. Phoenix Printing       | 31. City Computers            |
| 12. Compumedia Systems     | 32. Data Cable                |
| 13. Dick Smith Electronics | 33. Verbatim                  |
| 14. Arthur Yates           | 34. Nashua                    |
| 15. Cudby and Meade        | 35. Computer Broking          |
| 16. Micro Source           |                               |
| 17. Integrity Systems      |                               |
| 18. Warburton Franki       |                               |
| 19. Byte Shop              |                               |
| 20. Computer Distributors  |                               |
| 21. Chubb                  |                               |
| 22. IRDOSS Systems         |                               |
| 23. Software Architects    |                               |

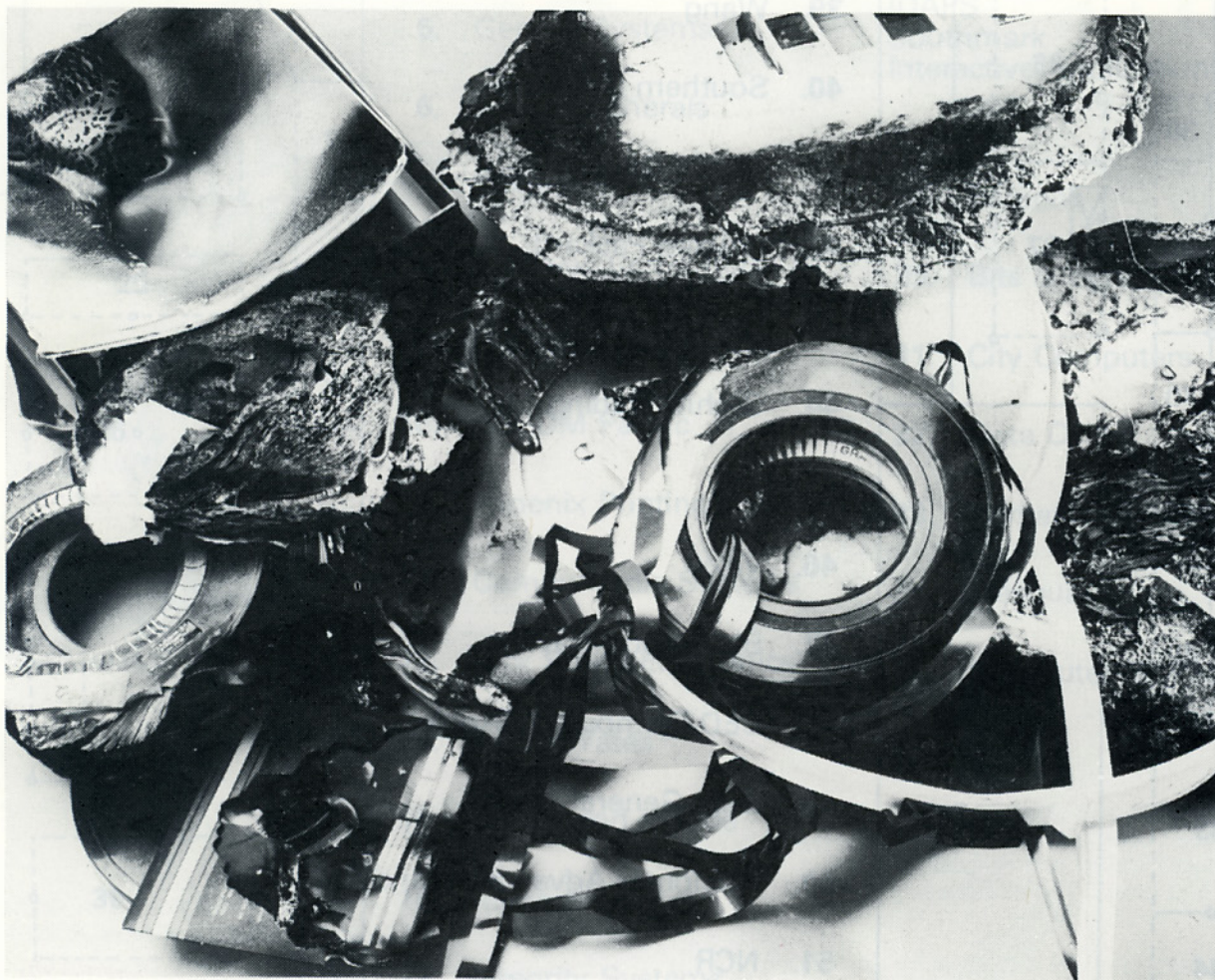
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36. Sord
37. Sanyo  
New Horizons
38. Computer Store
39. Wang
40. Southern Software
41. Power Corp
42. Hewlett Packard
43. Grandstand Leisure
44. Orchid Trading
45. 3M
46. Viko
47. Blackwood Gayle
48. CED Distributors (Apple)
49. Data General
50. Computer Advances (Tandy)
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# Ordinary filing systems can destroy your memory.



Discs, tapes, floppy discs, microfilm and microfiche — components of your company's vital business information system that, if not stored properly, could easily be damaged. Dealing a crippling blow to your business.

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Post this coupon now (no stamp required) and find out how the range of Chubb data storage cabinets could help your business survive. Better still, ask for a Chubb representative to call and discuss your total information protection requirements — it won't cost you a cent.



## Chubb

Better ways to protect your business

(Tick appropriate box)

- Please rush me more information on the range of Chubb data protection cabinets.
- Please arrange no-obligation visit from a Chubb representative.

Name: \_\_\_\_\_

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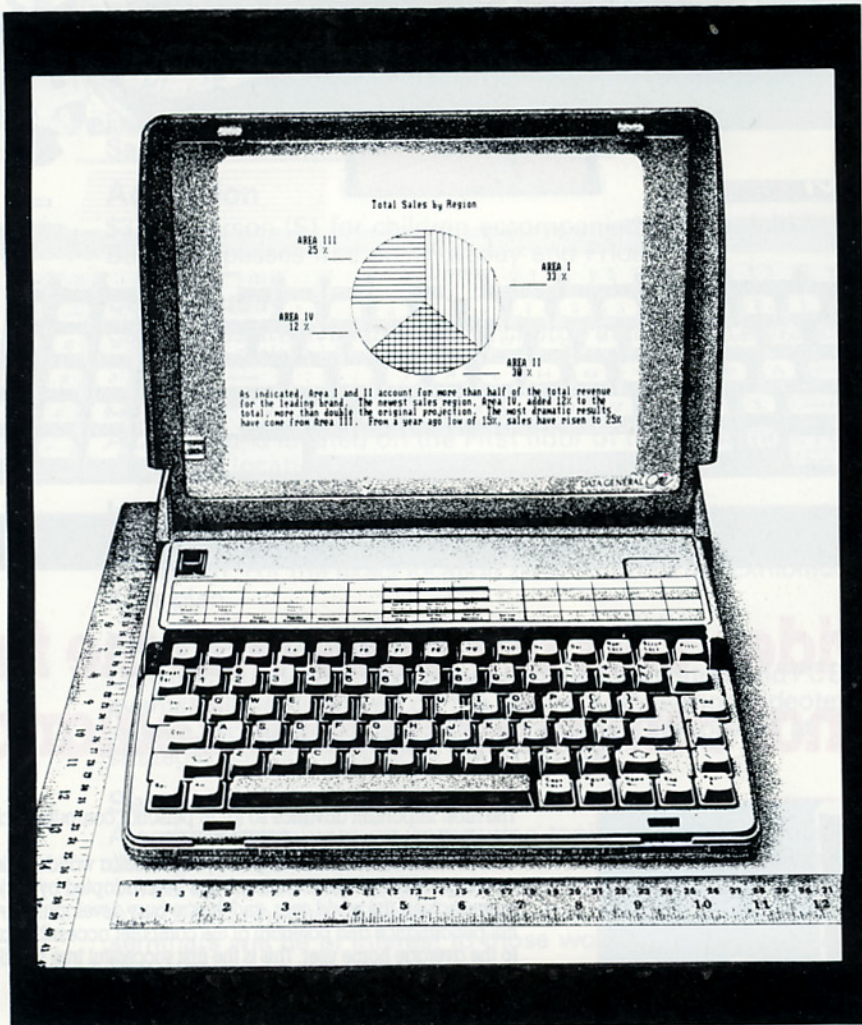
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POST IMMEDIATELY TO: CHUBB DATA PROTECTION, FREEPOST NO. 9,  
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DCW 4159

# INTRODUCING THE STANDARD BY WHICH EVERY OTHER PC WILL BE MEASURED:

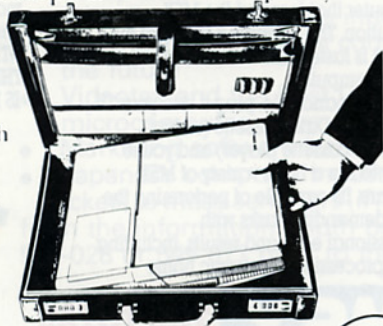
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The DATA GENERAL/One portable offers the capability of the leading PC in a size small enough to fit inside the average briefcase: 11.7 x 13.7 x 2.8 inches, and less than 11 pounds.

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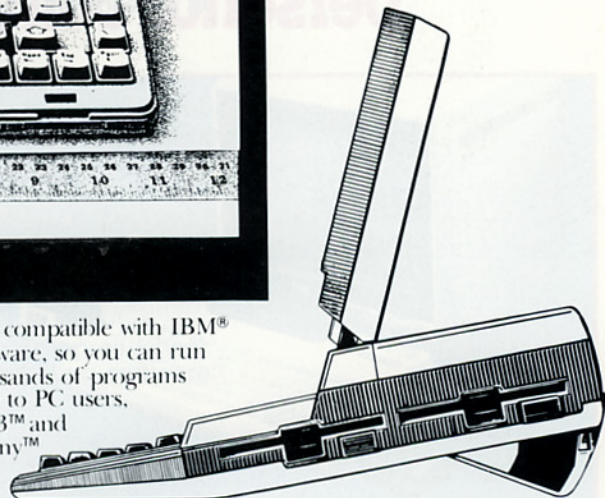


*Small enough to fit inside your briefcase.*

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*It has two built-in diskette drives and runs thousands of IBM-PC programs.*

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# SVI

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# MSX

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**DARGAVILLE:** Clarke and Parker. **WHANGAREI:** Northland Computer Systems. **AUCKLAND:** The Byte Shop, The Personal Computer Store, Takarunga and Mt Roskill, Piaggi Systems, Henderson, Lim's Electronics, Mangere East, Wes Burns, Howick. **PAPARURA:** South Auckland Computers. **THAMES:** Piaggi Systems. **HUNTLY:** Doug Morris. **WAIHI:** Stevens Radio Service. **HAMILTON:** A-1 Computer Service, Einstein Scientific, Knight Systems. **PAEROA:** Poulter Electronics. **TE AWAMUTU:** Waipa Radio & Hi Fi. **TOKOROA:** The Listening Post. **ROTORUA:** Microcomputer Systems. **TAURANGA:** KD Computers. **WHAKATANE:** Feedback Computers. **GISBORNE:** Microtech. **NAPIER:** The Computer Connection, Tarradale. **NEW PLYMOUTH:** Taranaki Micro Electronics. **WANGANUI:** Barlows Communications. **TAUPO:** Computer Clerical Services. **FIELDING:** David Brice Electronics. **PALMERSTON NORTH:** Businessworld Computers, Einstein Scientific. **MASTERTON:** Wairarapa Business Equipment, Businessworld Computers (Wai). **PARAPARAUMU:** Coastlands Bookshop. **LEVIN:** The Sound Centre. **WELLINGTON:** Einstein Scientific, Microstyle Computers, Petone. **NELSON:** Trafalgar Supply Co. **CHRISTCHURCH:** Custom Computers, Abacus the Microshop. **DUNEDIN:** Abacus Electronics. **QUEENSTOWN:** Ellek Communications. **INVERCARGILL:** Computer Sales.

K.D.A. CDL 4907

# Exhibition Information

## Opening Hours

Thursday 9 May 9am — 5pm  
Friday 10 May 9am — 7pm  
Saturday 11 May 9am — 5pm

## Admission

\$3 per person (\$1 for children accompanied by an adult).  
Business passes free on Thursday and Friday.

## Catalogues

Catalogues are available free of charge at the main entrance to the Exhibition.

## Catering

A cafeteria is located on the First floor of the Exhibition. For the exact location please turn to the Exhibition floor plan.

## Information

An information booth is located on the First floor of the Exhibition. For the exact location please turn to the Exhibition floor plan.

## Videotex Information

Constantly updated information on stands, exhibitors and PC 85 events will be displayed on the Barson's Rotavision videotex system. Screens displaying the information are located at strategic points throughout the exhibition.

## Seminars

A series of seminars on computing topics will be presented during PC 85 by expert local and international commentators.

The seminars will cover topics for both those new to computers and those experienced in their use. In addition some seminars will be of interest to those working in the computer industry.

## Seminar topics include:

- Computerising your business
- Introduction to wordprocessing software, spreadsheet software, data base software and accounting software
- Computers in education
- New Zealand software industry
- The business personal computer market — predictions for the future
- Videotex and the Post Office — the impact for microcomputer users
- Marketing software internationally
- Japanese computer industry and the West

Tickets to these seminars (if not fully booked) can be obtained from the information booth or telephone the organisers on 549-028 or 549-677 prior to the Exhibition.

# INTROD

# The New Printers



Star is a manufacturer with over thirty-five years of proven expertise in micro-precision technology. Our NC (numerically controlled) lathes, for example, create precision parts for manufacturers around the globe. Today's modern cameras, watches and VCRs depend upon Star's proprietary skills and technology for much of their ultra-high precision components. Printers do, of course, use microcomputers. But unlike computers, printers must have moving parts since they are basically mechanical machines. No amount of experience in computers can be a substitute for experience in creating precise and reliable parts.

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# FOREWORD

On behalf of all the exhibitors and the organisers, welcome to PC 85 — The First New Zealand Personal Computer Exhibition.

The Exhibition and its related events were conceived nine months ago to be a showpiece for the New Zealand microcomputer industry.

The excellent support for the concept from almost all the major distributors of microcomputer products in New Zealand has ensured that this will be the case. If you can't find a microcomputer related product you want or information about it on one of the stands at the exhibition then it is unlikely to be available in this country.

But PC 85 is more than just an Exhibition. A series of seminars, delivered by expert local and international

speakers and covering a variety of topics, will run in conjunction with the Exhibition. More details on these can be found on the Exhibition Information page or from the Information Booth.

At an industry dinner awards for excellence in New Zealand written and developed software will be presented to encourage the local software industry.

We urge you to use the opportunity created by PC 85 to see and compare this unrivalled range of personal computers, software, associated equipment and publications. We wish you an enjoyable and profitable visit.

The Organisers, PC 85.

## Exhibitors and products on display ...

**Company:** Applied Technology  
**Address:** P.O. Box 311, Hornsby 2077 Sydney, Australia  
**Products:** Microbee Computers

**Company:** Apple Computer  
**Address:** 7 College Hill, Ponsonby Auckland 2. (Private Bag, Ponsonby, Auckland.)  
**Telephone:** (09) 399 930  
**Products:** Networking, Macintosh, Macintosh XL, Apple IIc, Apple IIe, Laser Printer  
**Hardware:** Laser Printer  
**Software:** Various Business Software

**Company:** Archives Computer Distributions Ltd  
**Address:** 16 Clonbern Rd, Remuera Auckland 5.  
**Telephone:** 503 548  
**Hardware:** Morrow Computers and terminals Archives Printer, PC — Slave Processor Board, Morrow Pivot IBM Compatible Portable  
**Software:** All accounting applications Video Library System Dental Practice Management Law Practice System

**Company:** ARCOM Pacific, N.Z.  
**Address:** AMP Bldg, Victoria St, Hamilton. P.O. Box 852  
**Telephone:** 393 309  
**Personnel:** Kerry Baillie, Graeme Arlidge  
**Software:** Ashton-Tate: dBASEIII, Framework, Samna: Samnall. Digital Research: GEM Sorcim/IVS: Super Project

**Company:** Arthur Yates & Co  
**Address:** 270 Neilson St. P.O. Box 940 Auckland  
**Telephone:** 641-229  
**Products:** Agricultural computer systems  
**Hardware:** Includes, Hewlett Packard and Epson personal

computers. (Sanyo and ICL PC's may also be demonstrated) Videotex will also be demonstrated on FARMFAX

**Software:** Our integrated software packages include: Financial recording & analysis, Feed Budgeting, Livestock planning, utilities, Breeding package, Horticultural management system, coolstore management system, Wages and other miscellaneous software. All software is designed to be integrated to form a complete information management system

**Company:** Barson Computers  
**Address:** 1 Ngaire Ave, Epsom P.O. Box 26-287 Auckland  
**Telephone:** 504-049  
**Personnel:** J. Joyce, P. Pauling, G. Binstow, C. Raines, T. Krzyzewski, E. Green, C. Brown, P. Revell, A. Munro  
**Hardware:** Apricot, BBC and Electron Microcomputers  
**Software:** Educational and entertainment software plus general business software for the Apricot range including Lotus 1,2,3, Symphony, Framework, dBASE, Open Access, Word Perfect, Concurrent CPM and MS Windows

**Company:** BITS & BYTES  
**Address:** P.O. Box 9870, Auckland (Advertising); P.O. Box 827, Christchurch (Subscriptions)  
**Telephone:** AK 549-028, CHCH 66-566  
**Personnel:** Dion Crooks, Jocelyn Howard, Paul Crooks  
**Products:** Magazines. BITS & BYTES is by far the largest selling computer

magazine in New Zealand. The latest issue and a range of back copies will be on sale. New subscriptions and subscription renewals will be available.

**Company:** Blackwood Gayle Distributors Ltd  
**Address:** 178 Marua Rd Auckland  
**Telephone:** 591 503  
**Personnel:** Mr Toni Cassin  
**Products:** Computer Software and Books  
**Software:** CBS, Avalon Hill, Spinnaker Fisherprice, EPYX, Ssi, Tellarium, Gamesworkshop

**Company:** Byte Shop  
**Address:** BNZ Building, Fort St P.O. Box 2191 Auckland  
**Telephone:** 32 860  
**Products:** IBM, Canon and Apple computers plus various software.

**Company:** CHUBB New Zealand Limited  
**Address:** 24 Burleigh Street Mt Eden  
**Telephone:** 770 899  
**Personnel:** Eric Blake, Werner Muellers Jim Bailey, Paul Baldock Bryan Trim, Kumar Kumaran  
**Products:** CHUBB Data Protection Cabinets. Cabinets for the protection of vital data through disaster situations

**Company:** City Computers Ltd  
**Address:** P.O. Box 5128 Auckland  
**Telephone:** 734 111  
**Personnel:** Mr L. Kirschberg Mrs. Mclsaac  
**Products:** Philips multiuser equipment  
**Hardware:** Philips 4 and 8 user systems P3500/P3800 portable system P2000  
**Software:** Cogito multiuser software SYBIZ. Ascent. Teletex

# SORD

## COMPUTER SYSTEMS

Helping people and Business solve Problems

- PERSONAL AND MICRO COMPUTERS
- PORTABLE DATA ENTRY COMPUTERS
- BUSINESS SOFTWARE PACKAGES
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    - WORD PROCESSING
    - SPREAD SHEETS
  - AGRICULTURAL SOFTWARE
  - CAD/CAE/CAM SYSTEMS
  - COMPUTER PERIPHERALS
    - PRINTERS

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Wellington. Telephone 848-069. FAX (04) 845-714.

**SORD**



# Exhibitors and products on display ...

**Company:** Commodore Computer NZ Ltd  
**Address:** 250 Forrest Hill Rd, Forrest Hill P.O. Box 33847 Auckland 9 410 9182  
**Telephone:** Graeme Truman, Mike Cooch, Terry Smith, Richard Thornton Ngara Hanna, Dave Boyd  
**Personnel:** C64, 16, Plus 4, SX 64, Commodore PC. CBM 700 series, 600 series 1,8000 series.  
**Hardware:** Full range of software for Home Education and Business. Videotex  
**Software:**

**Company:** Compumedia Systems Ltd  
**Address:** 16 Woodson Place Glenfield P.O. Box 3273, Auckland 4446 085  
**Telephone:** Gregg Watson, Leeane Wordell, Clark Thompson, Scott Green, Peter Corkery, Mavis Newton  
**Personnel:** Panasonic Senior Partner. IBM Compatable. Maxell Floppy Disks. Datalite Floppy Disks. BASF Computer Tape, AFL cleaning and computer care products. Precision computer ribbons, precision word processing and lineflo paper  
**Hardware:**

disk-minder storage units. Computer furniture

**Company:** Computer Advances Ltd  
**Address:** 182 Gt South Rd P.O. Box 17233 Greenlane Auckland  
**Telephone:** 500 536  
**Personnel:** Steve Shilham, Keith Redit Roger Foote  
**Hardware:** Full range of Tandy computers from Model 100 to Model 6000  
**Software:** Acclaim Accounting. Auto cad various MSDOS, Xenix

**Company:** Computer Broking Services Limited  
**Address:** Control Data House (or Box 934) 53 Boulcourt Street, Wellington  
**Telephone:** (04) 723-481  
**Personnel:** Mr. John Story  
**Products:** Corvus Lan, Onyx, Tab, PFE  
**Hardware:** Corvus OmniNet Local Area Network including IBM workstations, Hard Disks, 200MB Bank, Printer Spooler, diskette — less PC etc will be operating. In addition Corvus products for Appletalk will be on display using Apple Macintosh's.

Any products ordered by end-users during the exhibition will be supplied during May at our Dealer prices plus 10% — a huge saving for anyone thinking of establishing a network of microcomputers, be it IBM, DEC, Apple, TI, Sperry, Sanyo, Zenith, Olivetti, Corona, etc. Information on Onyx multi-user micros operating under MP/M, Oasis, Concurrent DOS and Unix will be on hand. Bursters and maintenance service available nationwide. Computer Broking Services Limited was established during 1970, and is not a Dealer as such but imports and sells to Dealers and End-Users alike.

**Company:** Computer Distributors Ltd  
**Address:** P.O. Box 31 355 Milford  
**Telephone:** 495-809 495-624 496-085  
**Products:** Spectravideo computers and related products  
**Hardware:** Spectravideo Business Computers. Spectravideo Home Computers and full range of peripherals  
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You're already in business and it's growing steadily.

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What you need is a computer to look after your interests, as your company expands over the years. A computer that can tackle any business activity. A computer that will not date this year, next year, or the year after that. A computer that can also offer you the largest range of business software available.



Apricot XI

The answer is an Apricot.

Following a fine British tradition, Applied Computer Techniques offer some of the finest technology available in the world.

So if you've the taste for success, pick Apricot and watch your business grow.



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Simply Superior.



Apricot XI

The Apricot XI offers Winchester disc technology in the most compact size currently available — the 3.5" fixed disc — in a choice of 5, 10 or 20 Megabyte capacity.

The Apricot XI is also fully transportable by using a unique arrangement of attaching the keyboard to the underside of the systems unit.



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Apricot F1



Apricot Portable

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computers

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Hard Disc  
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# Exhibitors and products on display ...

**Company:** Computer Now Ltd/  
Consulting Int'l Ltd  
**Address:** 100 Ponsonby Rd Ponsonby  
Auckland  
**Telephone:** 789-128  
**Personnel:** Tony, Des, Gary,  
Kathy, Pam  
**Products:** C-64  
**Hardware:** CBM 8296D with Integral  
disk drives. SX-64 Portable  
Colour Computer. C-64,  
C-16, PLUS -4 Commodore  
P.C. running MSDOS  
**Software:** Accounting,  
Wordprocessing  
Financial Modelling  
Educational Software  
Recreational Software,

Videotex Super Networking  
System for C-64's

**Company:** Computer Store Div. of  
Albertland Enterprise Ltd  
**Address:** 48 Kitchener Road  
P.O. Box 31-261 Milford  
Auckland 9  
**Telephone:** (09) 499-458  
**Personnel:** Mr. E.M. Zimmermann  
(and Others)  
**Hardware:** SWTPC 6809 based  
multiuser, multitasking  
computer systems  
Micropolis disk drives  
**Software:** Ashton Tate (Friday, dBASE  
Frame Work) Digital  
Research (DR Draw, DR

Graph, Languages, Tools,  
Concurrent CP/M) Sorcim  
(Superwriter, Supercalc),  
Micro Focus (Levelll  
COBOL) Technical Systems  
Consultants (6809  
Software) Rezman low cost  
accounting packages.  
Dr. Dobbs Journal  
Daisy wheel print elements

**Company:** Computer World  
**Address:** 23 Victoria St East  
Auckland City  
**Telephone:** 399 216  
**Personnel:** Dave Best, Ian Williams,  
Des Krause  
**Products:** Computers, Printers,  
Plan printers.  
**Hardware:** Apple computers. Lisa  
Macintosh. Ile. Ilc. Sanyo  
computers (IBM  
compatibles) 555 Series,  
775 (portable) Televideo  
(IBM compatibles)  
**Software:** Financiers Forecasting,  
Managers Cashflow  
planning, Contractors  
Estimating Project,  
Resource Scheduling, CAD  
Drafting.

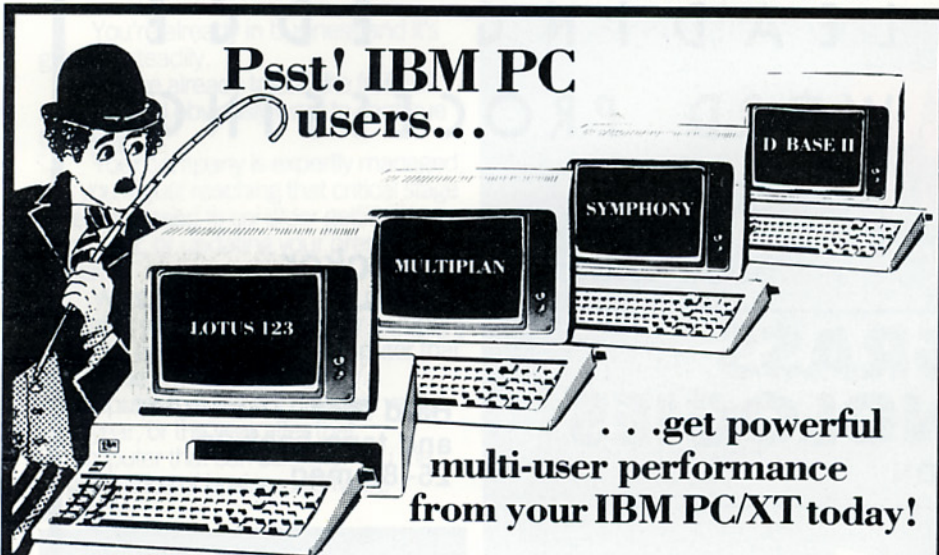
**Company:** Cudby & Meade Limited  
**Address:** P.O. Box 44-096 Lower Hutt  
**Telephone:** Wellington: 660-962  
**Personnel:** M. Cudby. N. Adams  
**Products:** Computer furniture

**Company:** David Reid Electronics  
**Address:** 35 Rawene Road Birkenhead  
C.P.O. Box 2630. Auckland  
**Telephone:** 488-0449  
**Products:** Sinclair Computers  
**Hardware:** Sinclair 'QL'. Sinclair  
Spectrum \* Sinclair  
peripherals.

**Company:** Genesis Systems Ltd  
**Address:** 65 Huia Rd, Otahuhu  
P.O. Box 6255 Wellesley St  
Auckland  
**Telephone:** 276 7349, 276-6361  
**Personnel:** Leon Howe, Graeme  
McLennan, Mathew  
Weavers  
**Products:** Star printer range  
**Hardware:** Full range of Star Dot  
Matrix printers

**Company:** Datacable Supply and  
Installation Services Ltd  
**Address:** P.O. Box 4317 Auckland  
**Telephone:** 810-9526, 439-271

**Company:** Data General  
**Address:** Head Office:  
P.O. Box 9735 Wellington  
Auckland Office:  
P.O. Box 5175  
**Telephone:** 723 900 (Wgtn),  
792 610 (Auck)  
**Personnel:** Peter Uffindell, Kelvin  
Flavall, Jill Horsley  
Doug Barr  
**Hardware:** Date General One,  
Personal System  
Desk Top Generation



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Position .....

Company .....

Address .....

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(NZ Computer Review Autumn 1984)



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Another feature is the **CP/M Plus Operating System** that gives you access to thousands of other software programs. And we take the mystery out of CP/M with plain English commands and single-key operation. The Morrow is many times faster than even comparable business systems and the 11 megabytes of hard disk space available on the system illustrated is enough for 4800 pages of text, or up to 40,000 names, addresses and phone numbers. Call into your nearest Morrow dealer now for a convincing demonstration. The Morrow Micro Decision will be one of the **best** business decisions you've ever made.



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# Exhibitors and products on display ...

**Software:** DG/10SP  
 DG-1 Videotex — CEO Connection, Lotus 1,2,3, dBASE II, popular business application packages eg. IAL, IMs, Sybiz

**Company:** Data Peripherals  
**Address:** 3 Byron Ave P.O. Box 33 326, Takapuna  
**Telephone:** 491 303

**Personnel:** James Crossley, John Forster, Bruce Busbridge, Kerry Siter, Brent Denerly, Max Templeton, Bob Shaw, David Corrick

**Hardware:** Televideo Multiuser. IBM compatible PC's Networking

**Software:** IBM Compatible MS-DOS software

**Company:** Dick Smith Electronics Pty Limited  
**Address:** Newmarket: 98 Carlton Gore Road. 504 409  
 Avondale: 1795 Great North Road. 886 696  
 Papatoetoe: 26 East Tamaki Road. 278 2355  
 Ak City: Cnr Fort & Commerce St. 389 974  
 Hamilton: 450 Anglesea Street. 394 490  
 Wellington: 154 Featherston Street. 739 858  
 Christchurch: Cnr Victoria

Street & Bealey Ave — 50 405  
 Dunedin: Cnr Manse & Stafford St. 741 096

**Personnel:** Dick Smith Electronics Computer Product Specialists

**Products:** A complete range of computers — from \$179 to over \$10,000. An extensive range of computer peripherals, printers, monitors, books and software.

**Hardware:** New Zealand's lowest price colour computer — The Aquarius Computer, fantastic value at only \$179. The Learning Machine — Commodores incredible C16 at \$395. New Zealand's most popular microcomputer — The Commodore 64 \$695. Packed with features — The Apple Compatible Cat Computer \$1295. BX80 Dot Matrix Printer \$695. Hi-Res RGB Monitor \$795. 18CPS High Quality Dot Matrix Printer \$795. Kitset Mega Modem only \$175. Fantastic value Mitsubishi Green Screen Monitor \$279. Apple Compatible "Chinnon" Disk Drives only \$498.

Professional Amber Monitor \$349. Computer Datacassette including power supply \$64.95 and a massive variety of computer peripherals for the Aquarius, VZ200, C16, Commodore 64 and Cat Computer will also be on display.

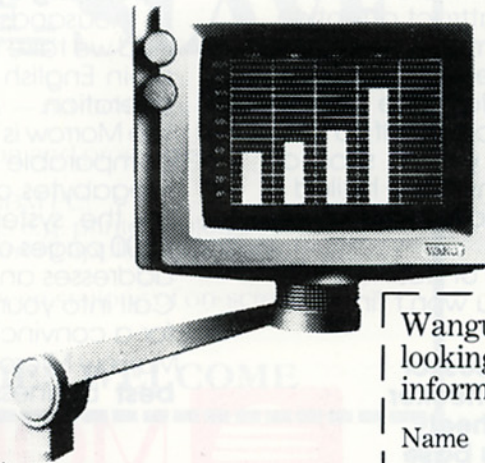
**Software:** Aquarius software cassettes from \$12.95, VZ200 software from \$18.50 C16 cartridge and cassette software, Commodore 64 cartridge, disk and cassette software, Cat Business, Word Processing and entertainment software. Computer Books, Printer Paper, Ribbons and Labels, Disks and Datacassettes and much, much, more.

**Company:** Grandstand Leisure  
**Address:** P.O. Box 2353, Auckland  
**Telephone:** 504 035  
**Products:** Amstrad and Sega Computers, peripherals and software.

**Company:** Hewlett Packard  
**Address:** P.O. Box 9443 Wellington  
**Telephone:** 877 199  
**Products:** Hewlett Packard

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 Marketing Manager,  
 WANG COMPUTER  
 PO Box 8804  
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PC85

# WANG

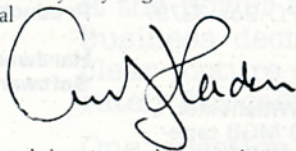
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# So, what does a professional writer like me know about personal computers?

Andy Haden, author of "Boots 'n All",  
with his NEC Advanced Personal  
Computer III.

"The amazing APC III from NEC handles just about anything you care to throw its way, from word processing to business accounting. It's fast, very adaptable and very easy to get on with. Take it from me, the APC III is a real beauty. It's so good, you can write a book on it — then use it to keep track of the royalties".



## Better than the best.

The APC III is even more advanced than its predecessor the Advanced Personal Computer — and that's the one that Australian analysts voted 'Best Computer of the Year'.

To start with, the APC III is incredibly fast. You still get the benefits of the industry-standard MS-DOS operating system. But with a processor that runs almost twice as fast, plus a 16-bit data path, the APC can run the same software between 2 to 6 times faster than a standard personal computer.

The most basic APC III offers 128 Kbytes of Random Access Memory, floppy disk storage of 720 Kbytes, and an optional integral hard disk unit which stores 10 Megabytes. Each of these features is expandable.

The keyboard is detached, and the monitor is fully adjustable for maximum user comfort. It can be swivelled or tilted in any direction and it gives you beautifully clear, easy-to-read images, even presentation-quality coloured graphs and charts. All in all, the APC III offers unparalleled performance in a personal computer. The professionals — like Andy Haden — agree.

## From the Giant.

The APC III is the latest from Japan's biggest supplier of personal and small business computers, NEC.

We also make the world's fastest computers, the SC-1/SX-2 Supercomputers. Our satellite componentry circles the globe dozens of times every day. And we have installed over 600 satellite communications earth stations in countries around the world, including both the United States and the Soviet Union.

So although we may be a relative newcomer to the New Zealand computer scene, we're an international giant in the field of computers and communications.

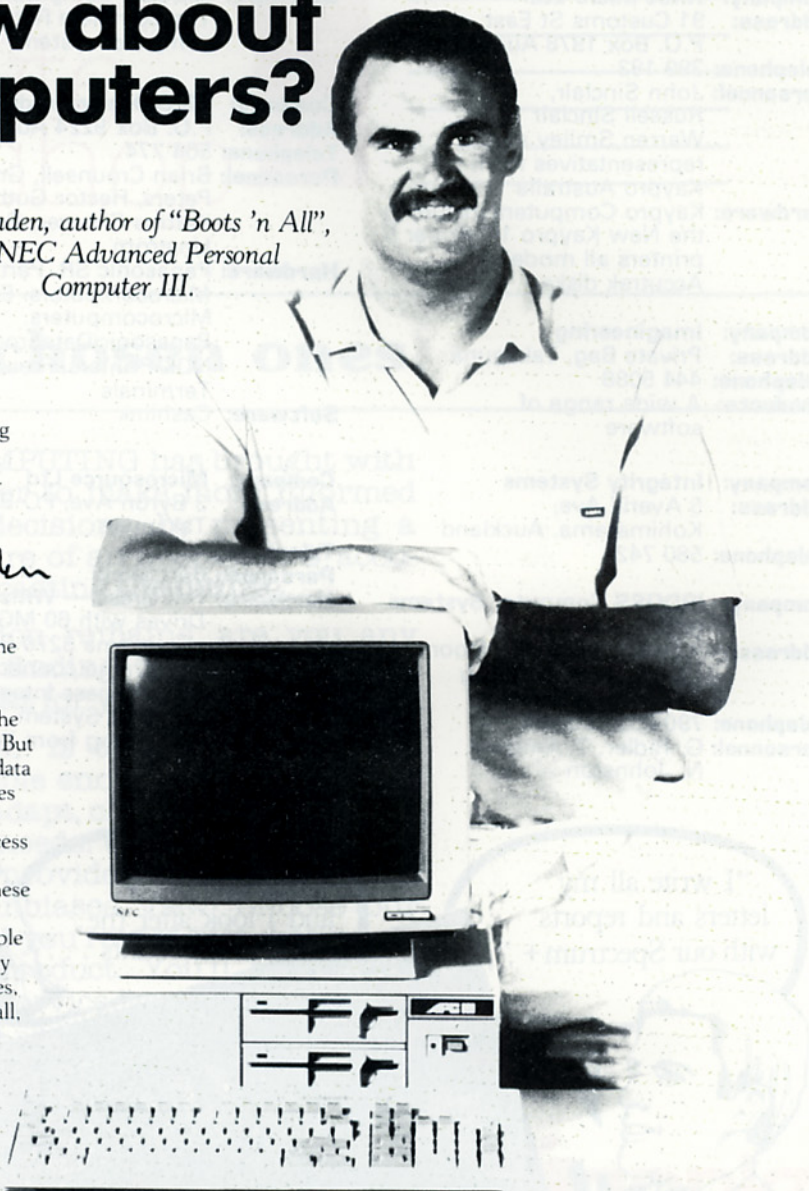
## Top value for money.

The APC III is a giant step forward. It's also terrific value for your money.

Get your hands onto one at your nearest NEC dealer now. You'll find the price just as surprising as the performance.

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# Exhibitors and products on display ...

Computers and associated products.

**Company:** Hitec Micro Ltd.  
**Address:** 91 Customs St East  
P.O. Box 1978 Auckland 1

**Telephone:** 399 183

**Personnel:** John Sinclair,  
Russell Sinclair  
Warren Smiley and  
representatives from  
Kaypro Australia

**Hardware:** Kaypro Computers including  
the New Kaypro 16, Super 5  
printers all models,  
Accutrak disks

**Company:** Imagineering  
**Address:** Private Bag, Takapuna  
**Telephone:** 444 5088  
**Products:** A wide range of  
software

**Company:** Integrity Systems  
**Address:** 5 Averill Ave,  
Kohimarama. Auckland  
**Telephone:** 580 742

**Company:** IRDOSS Computer Systems  
(Intl) Limited

**Address:** P.O. Box 8683, 3rd Floor  
CBA Finance Building  
100 Symonds Street

**Telephone:** 790-262 790-264

**Personnel:** G. Ridler. T. Ambarly  
N. Johnston

**Hardware:** IBM PC XT and AT. Sanyo  
Point of Sale equipment  
and coding devices  
**Software:** IRDOSS Computer software  
The complete Retailer  
computer system

**Company:** MEC Dealer Products  
**Address:** P.O. Box 9224 Auckland  
**Telephone:** 504 774

**Personnel:** Brian Crounell, Grahame  
Peters, Hector Guthrie,  
Katrina Shearer, Gerard  
Unstrom

**Hardware:** Panasonic SR. Partner.  
Microcomputers. Eagle  
Microcomputers.  
Panasonic/Dataproducts/  
NDK Printers. Freedom/Cltoh  
Terminals

**Software:** Cashlink

**Company:** Microsource Ltd  
**Address:** 3 Byron Ave, PO Box 33797  
Takapuna

**Telephone:** 496 445

**Personnel:** Bob Shaw

**Hardware:** Tall Grass — Winchester  
Drives with 60 MGB tape-  
akup Irma 3270 PC to  
Mainframe connection.

**Software:** Open Access Integrated  
Business System, Word  
Processing from Leading  
Edge

**Company:** Micronetworks  
**Address:** 51 Wakefield St,  
P.O. Box 6516 Auckland  
**Telephone:** 399 245

**Company:** Monaco Distributors  
**Address:** P.O. Box 4399 Auckland  
**Telephone:** 444 9144

**Company:** Nashua  
**Address:** P.O. Box 39075  
Auckland West  
**Telephone:** 589 571  
**Products:** Nashua disks

**Company:** New Horizons Ltd  
**Address:** 4126 Great North Rd  
Glen Eden  
**Telephone:** 818-4270  
**Personnel:** Brent Sutton, Colin Brown,  
Mike Lopez  
**Products:** Intearated Accounting  
System

**Hardware:** Sanyo. IBM. Sharp  
**Software:** Integrated Accounting  
System. Debtors Ledger,  
Creditors Ledger,  
General Ledger, Stock  
Ledger, Sales Order  
Processing, Invoicing,  
Purchase Order Processing,  
Data Distributor.  
Video Rental System

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A powerful 48K of memory and the new professional style keyboard (ergonomically designed for fast keying) keep the Sinclair Spectrum+ top of its class!

Peripherals? You want peripherals — well, we've got them... interfaces to add joysticks and plug in ROMs, ZX Microdrives, printers, RS232... everything you will ever need to make the most of your Spectrum+.

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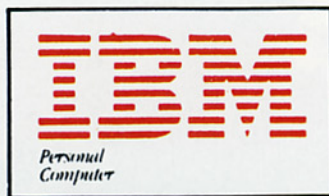
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COMPUTER SYSTEMS 

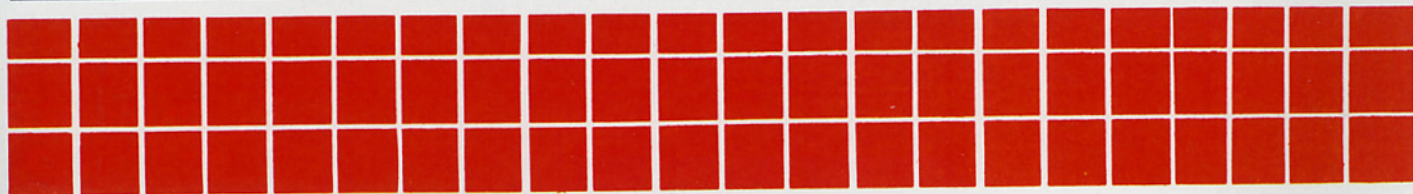
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Computer Advances Ltd - 182 Remuera Road, Remuera, Auckland 5, Telephone: (09) 500-536

# Exhibitors and products on display ...

**Company:** NCR (NZ) Limited  
**Address:** 46 Wakefield St P.O. Box 5945, Auckland

**Telephone:** 796-920  
**Personnel:** Bruce Hickman, Paul Sutherland, Ian Howard John Karl

**Products:** Micro-computers  
**Hardware:** NCR PC4i  
**Software:** Industry standard

**Company:** Orchid Trading  
**Address:** P.O. Box 28151 Auckland  
**Telephone:** 643 770  
**Products:** Bondwell Computers

**Company:**  
**PAXUS Information Services Group**  
The following four companies are part of the PAXUS Group and will all be exhibiting on the PAXUS stand.

**Company:** Interactive Applications  
**Address:** P.O. Box 6330 Wellesley Street

**Telephone:** 504-609  
**Hardware:** IBM PC AT, Macintosh  
**Software:** The Charter Series with Point of Sale System, Beancounter on Apple Macintosh Microsofts range of productivity tools and languages, Thoughtware range of Computer Aided Learning systems

**Company:** Southmark Electronics Ltd  
**Address:** P.O. Box 3407 Auckland  
**Telephone:** 798-005  
**Personnel:** Peter McKay, Kevin Taylor  
**Hardware:** Computers, Printers

**Company:** Framework Information Systems Limited  
**Address:** P.O. Box 8698 Symonds St Auckland  
**Telephone:** 792 557  
**Hardware:** Data General One  
**Software:** Business (various), CAD.

**Company:** Idaps Computer Science (N.Z.) Limited  
**Address:** 171 Grafton Rd. Grafton P.O. Box 6643 Auckland  
**Telephone:** 770 239  
**Personnel:** Ian Gordon  
**Products:** IBM range of PC's and related products

**Hardware:** IBM XT, HP Plotter, IBM AT, DTC 450Z, IBM Portable, IBM P.C  
**Software:** SAM, FCS — EPS Financial Modelling, Local Area Network, Microsoft Project, Word processing

**Company:** Powercorp Ltd  
**Address:** P.O. Box 27399 Wellington  
**Telephone:** 600 742

**Company:** Sanyo Business Systems  
**Address:** 97 Great South Rd Auckland  
**Telephone:** 688-033  
**Personnel:** K Davis, M. Taylor  
**Products:** MBC550 Computer Series, MBC775 Portable Computer

**Company:** Silkwood Manufacturing  
**Address:** 8 Tironui Rd, Papakura  
**Telephone:** 2987 089  
**Personnel:** Kevin Shuker, George Forster  
**Products:** Computer Furniture

**Company:** Sord Computer Systems  
**Address:** P.O. Box 9447 Wellington  
**Telephone:** 848 069  
**Products:** Sord Computers, Computer Aided Design, printers and communication equipment

**Company:** Software Architects Ltd (NEC Microcomputers)  
**Address:** Software Architects House 25 Davis Cres, Newmarket P.O. Box 9652  
**Telephone:** 540 055  
**Personnel:** Chris Johnson, Mark Ivil Greg Smirk, Sally Horsup  
**Products:** NEC Microcomputers Spinwriters & Pinwriters  
**Software:** Business assessment available to determine what software you require

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# Exhibitors and products on display ...

**Company:** Southern Software Co. Ltd  
**Address:** 58 Symonds St, Auckland  
 P.O. Box 8683 Symonds St  
**Telephone:** 778 525  
**Personnel:** Sally Bowler, Les Chapman  
 Graham Gleadell, Graeme Bowers

**Software:** Versa map for the HP 150  
 The Remarkable Film  
 System Mac Chemistry for  
 the Macintosh Halo  
 Accounting System, ABS  
 Apple Business System

**Company:** Technical Books  
**Address:** 6 Morrow St Newmarket  
**Telephone:** 540-131 540-132  
**Products:** Computer Books

**Company:** The Phoenix Printing  
 Company Limited  
**Address:** P.O. Box 5349 Wellesley St  
 113 Wellesley St  
**Telephone:** 34 027  
**Personnel:** Warwick Goodale, Kel  
 Hurford, Mike Laycock,  
 Tony Dawson  
**Products:** All printing requirements

from source documentation  
 through to invoices and  
 statements

**Company:** University Bookshop  
 (Auckland) Ltd  
**Address:** 34 Kitchener St  
**Telephone:** 771 869  
**Personnel:** Paul Summers, John Pringle  
**Products:** Computer Books and  
 Software. Displayed by  
 Reed Methuen, McCraw,  
 Hill, Whitehall,  
 Penguin, Pitman, Roulston  
 Greene, John Wiley.

**Company:** Verbatim  
**Address:** P.O. Box 11-591 Wellington  
**Telephone:** 858 615  
**Products:** Verbatim disks

**Company:** Viko Computergraphics  
 Division  
**Address:** P.O. Box 220 Newmarket  
 Auckland  
**Telephone:** 545 199  
**Products:** Computer Aided Design

**Company:** Warburton Franki  
**Address:** Private Bag, Takapuna  
**Telephone:** 444 2645  
**Products:** Zenith Computers and  
 peripheral equipment.

**Company:** Wang Computer Limited  
**Address:** 44 Khyber Pass Rd  
 P.O. Box 8804 Auckland  
**Telephone:** 796-372  
**Hardware:** Wang Professional  
 Computer, Wang  
 Professional Image  
 Computer  
 Wang Office Assistant  
**Software:** Word Processing. Multiplan.  
 Imaging Software. Database

**Company:** 3M NZ Limited  
**Address:** P.O. Box 33246 Takapuna  
**Telephone:** 4444 760, Ext 822  
**Products:** Computer Media and Static  
 Control Systems  
**Hardware:** Diskettes. Data Cartridges  
 Head cleaning kits.  
 CRT films

**Company:** ICL & Everly Business  
 Systems Limited  
**Address:** P.O. Box 33-842 Takapuna  
 Auckland, 9  
**Telephone:** 494-068  
**Personnel:** Ken Connoley, Raewyn  
 Shaw, David Everett  
 Greg Magnus  
**Products:**  
**Hardware:** I.C.L. PC and Multi User  
 Solution  
**Software:** Target, C.B.A. and  
 Videotex



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 Mark a cell in the middle of text that will be linked to your spreadsheet and updated as numbers in the spreadsheet change.  
 Move dynamically between the worksheet and the print version of the worksheet as you go into and out of the spreadsheet mode. This means you will immediately see how your document will look when printed.  
 Bold, underline, double underline or capitalize words or numbers in your spreadsheet.  
 Use your cursor to point to cells, ranges, etc., and specify the coordinates.  
 Split your screen vertically or horizontally to compare columns or rows.  
 Move or copy cells, ranges, columns or rows.  
 Type several spreadsheets in one document and link them together.  
 Type up to 250 words or descriptions and have them automatically wrap into a range of linked cells.

**Use Word Base Manager to:**  
 Quickly check all your resume files to locate people on staff with experience in particular areas, (oil exploration and Middle East for example).  
 Keep a log of all your ideas or phone calls, then quickly retrieve those ideas on a certain subject or phone calls with a particular client.  
 Maintain an electronic Rolodex and find all those people in your files who are writers, artists, printers, etc. - even if you don't know their name or the company name.  
 Attorneys can search through hundreds of pages of depositions to find every occurrence or reference to a particular date, person, etc. within seconds.

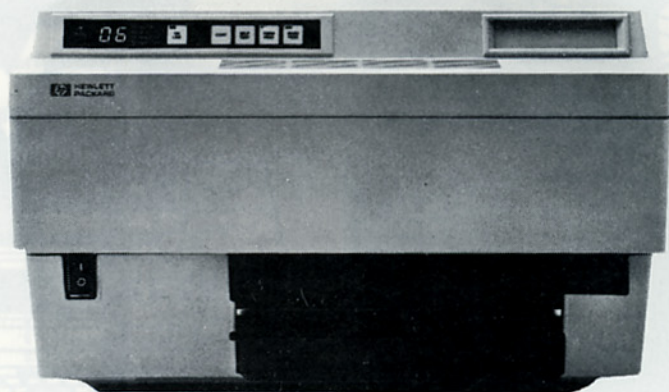
**HARDWARE REQUIREMENTS:**  
 384K memory for IBM with DOS 2.0  
 448K memory for all other versions  
 Two double-sided floppy drives or one double-sided and one hard disk drive

**COMPUTERS SUPPORTED:**  
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 IBM XT and most compatibles  
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 Texas Instruments Professional

**OPERATING SYSTEMS:**  
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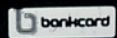
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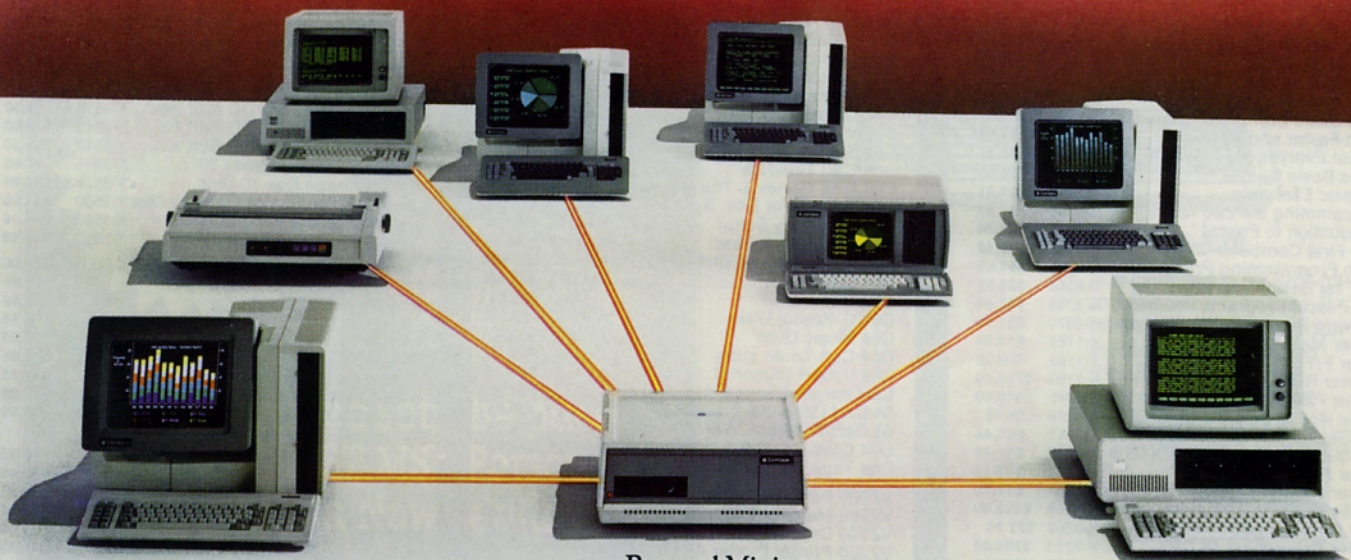
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# Our software priorities

By Richard McLean

Many computer experts have taken hedonistic delight in the advances and breakthroughs in computer technology which are daily news in the ongoing computer revolution.

The race between manufacturers for inventions and development of new products is a two-sided sword: it stimulates computer experts, satisfying their "habit", while providing more choice (and confusion) for the commercial computer user in the uneasy task of making purchase decisions.

An investment in computing for the small business or the large corporation is similar, the contrast in system size and cost being relative to their daily scale of activities. Both experience difficulty making purchase decisions which involve considerable financial commitment with products that are somewhat mysterious and which change rapidly.

In the 1970s, the rapid development of microcomputers minimised the investment required to buy computer power but the development did not bring widespread use of microcomputers into business and commerce. Several developments, specifically within the microcomputer industry, have resulted in hundreds of microcomputers being bought to handle jobs which earlier would not have been deemed possible on this low cost equipment.

## Catalysts of change

Today, small business, medium-sized business and firms, large corporations and government departments are buying personal computers (PCs) for accounting, planning, office productivity, payroll and a variety of other uses. Orders for 10 to 20 PCs are now quite regular occurrences in New Zealand.

I recently met a computer expert who felt threatened and insecure with both the rapid acceptance of PCs and the attitude of confident enthusiasm shown by PC users who delight in the new developments detailed monthly in their computer magazine.

If the PC market basically did not exist three years ago, what has happened? What has changed the acceptance factor so dramatically in this short time that in some cases the attitudes of expert and user are reversed?

The combination of factors includes product maturity, IBM's entry into this market, price reductions to name a few. But the main single factor is software.

If we quickly review the common priorities used to make computer purchasing decisions which are likely to be successful working solutions and secure investments, the priorities are along these lines:

- PRIORITY 1 — analyse the job to be done by the computer.
- PRIORITY 2 — identify software which adequately performs the job as analysed.
- PRIORITY 3 — match the software with a reliable computer brand — on which the software works.
- PRIORITY 4 — select a supplier of both the software and hardware who has a proven track record in support and service.

Priority 1, your job, is followed by identifying the software which performs the functions required.

Thousands of software packages are available for PCs allowing hundreds of completely different business activities to be computerised.

There is an active software development industry in almost

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# ACCOUNTING PACKAGES

every developed country in the world. But the quality of the software produced varies significantly from one software developer to the next and from one program to the next.

New Zealand-developed software is actively and successfully competing with imported international products, particularly in the financial and business accounting market.

A large proportion of the PCs bought in New Zealand are used primarily for accounting applications.

Other applications are added to give added value to the computer investment.

## Active competition

The market is large enough to support active competition between products from a number of software houses and although various products may differ considerably, they are presented as competitive options.

The major brands of PC accounting software sold in New Zealand are of different ages and evolutionary generations. They are written in different languages, use a variety of file handling systems, offer vastly different ranges of accounting features, contrasting support services and quality of documentation.

In fact, the software options each represent solutions to specific work tasks. Large differences in price reflect that old adage — "you get what you pay for". How do you choose!

In the next four issues of *Bits and Bytes*, we will give a comprehensive review of the major brands of accounting software available in New Zealand to help PC users and potential users identify the accounting package which represents the most appropriate and secure purchase decision.

We will investigate the product backgrounds, origins and the spread of accounting modules offered. Accounting features will be detailed and compared in a graphic format and an insight will be offered into the operational features such as security, data integrity and robust operation along with the documentation and support issues.

There will be a summary of the products, comparing their suitability for various requirements with a recommendation.

At this stage, our short list of review products comprises Attache IMS Ascent, Powercorp Software and Sybiz.

We will be pleased to accept submissions from software suppliers or users suggesting other products for review. Please contact us promptly.

# SuperCalc<sup>3</sup>

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**SORCIM**

**SUPERCALC<sup>3</sup>**

SuperCalc<sup>3</sup>, from Sorcim, is the latest addition to Sorcim's famous family of spreadsheets. It adds fully integrated presentation quality graphics and a data management capability to the already-advanced features of SuperCalc<sup>2</sup>.

Access to the graphics of SuperCalc<sup>3</sup> is simple: just a single keystroke to view, print or plot. The graphic capabilities are contained within the system. There is no need to change disks, or to create an intermediate output file.

You can find and extract records from a data base area within a spreadsheet. For example, a name in a telephone directory list.

Other new features in SuperCalc<sup>3</sup> are a key sort and additional financial functions. Notably, Internal Rate of Return (IRR), future-value, present value and simple payment stream. Quotation marks are no longer required to differentiate between text and formulae.

SuperCalc<sup>3</sup> runs on the IBM PC, IBM PC-XT, and selected compatibles. Requires a minimum of 96k user memory. Neither colour nor graphics compulsory although recommended.

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Demonstration discs of SuperCalc<sup>3</sup> are available at \$25.00 each. Should you then decide to purchase SuperCalc<sup>3</sup> we will credit the cost of the demo disc provided you purchase SuperCalc<sup>3</sup> within 60 days.

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## EDUCATION

# Impact of a nanogram pop

By Dr Bernie Gunn

It would now be generally accepted that the impact of the computer in the educational scene has not been the gigatonne blast predicted a few years ago. Rather, it might be described as a nanogram pop. Why? Many schools have dozens, some hundreds, of small computers, but mainly they have been used to teach about computers, or to play video games.

Although the world's computing power has increased a million-fold in the last decade, there has been neither a parallel surge in scientific discovery nor are we appreciably more erudite. If I were to assert that the present school generation knew less history, science philosophy, language or even mathematics than any generation since the Crimea, few except professional teachers would disagree. And their manners, dear God! Their manners!

Brushing aside the fact that teachers are perhaps unwilling to be

superceded even partially by an unpaid machine, there seems to be a vast unbridged gap between the standards of what might be termed entertainment as opposed to educational software.

Entertainment software, as in video games, might be mindless but the sophistication of programming is undoubtedly there. The Sega home computer, for example, has a road race type of game called "Safari Trek" in which your road winds endlessly across the veldt between very real brown and green hills. The obstacles are lumbering elephants on the road, a charging rhino, a prancing springbok, a scampering cheetah — imagine a biology lesson with this kind of visual aid!

The reason entertainment software is so good of course, is purely commercial. A new "Star Trek" type of game called "Elite", written in England by two teenagers, is likely to earn a million dollars; an animated

lesson of Class Carnivora might sell a few dozen copies and school boards are notorious cheapskates.

Educational software, so-called, often gives an impression of having been written by a teacher enthusiast who, having acquired a new Beeb a week ago, has copied two pages of a text on to disk. It is invariably unimaginative, condescending in tone and amateurish in construction. It is exceedingly boring to be told 20 times the exact same phrase, eg. "No, Johnny, that is wrong!" A real teacher might use a dozen different ways of expressing approval and it is an elementary technique to use different forms of answers randomly; not to do this betrays the amateur. Programs that grade an answer of, eg. "14 sq.m." as "Wrong, the correct answer was 14 m.sq." send me up the twist.

Language teaching programs that do not use a voice simulation PROM are a waste of time; pronunciation is everything, grammar incidental. Most people in foreign lands speak a perfectly comprehensible English totally without such trivial refinements as past or future tenses. I well remember my daughter returning from her first day at Epsom Grammar in an advanced state of hysteria. "You should hear the French spoken in an Auckland accent!" she finally managed to say.

A nation that manages to pronounce the standard greeting as "Air gun, Mite?" has predictable problems with "Avez vous quelques a manger?" A la Noel Coward, the French don't care what you say actually, as long as you pronounce it right.

The educational world is just too small. Until we realise that a lesson on Class Ungulata is just as valid in Waharoa as in Swiftcurrent, Saskatchewan or even in Hell (which happens to be a small village near Trondheim, Norway), the market for educational software will always be too small.

## Sperry PC prices

The prices quoted for the Sperry personal computer in our review last month were incorrect.

The correct price for the base unit is \$7007 and other configurations range up to \$13,151.

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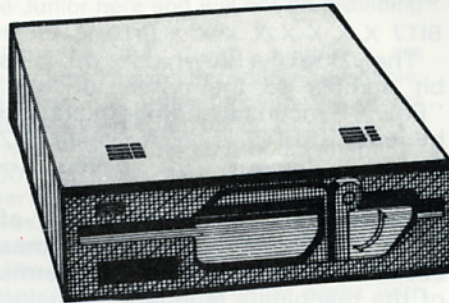
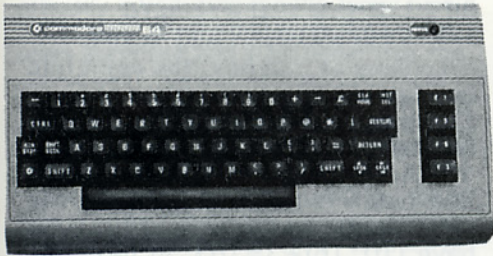
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The following series on machine code is for 6502-based computers including Atari, BBC, Commodore 64 and VIC-20 Computers.

As long as you know the BASIC syntax for your machine and allow for absolute addresses, most of the routines and explanations should be transferrable.

## High speed column

By Joe Colquitt

As a beginner myself once, I know how frustrating it is trying to get a grasp of machine language. The many books I read tended to be short on practical programs and "nuts and bolts" explanations. I hope to fix that for other beginners. Any BASIC presented is Commodore BASIC, and any ML should be transferable to other machines, especially those using 6502 processors, allowing for absolute address used.

To use ML effectively, it is not necessary to write a routine on the scale of a supersonic arcade game. ML is readily integrated into a BASIC program for special functions or time saving routines. Anything you can do in BASIC can be done in ML.

As an example, a common routine seen in magazine games is one which copies the character set from ROM to RAM. To copy 2048 bytes in BASIC takes 34 seconds; 0.01 seconds in ML. This is because the ML program does not need to be processed by the BASIC interpreter.

To seriously contemplate working in ML, a good ML monitor is needed, along with an understanding of hexadecimal and binary numbering. A monitor is comparable to the BASIC interpreter in that it allows you to enter, edit and test ML routines. Number systems should be understood because almost everything to do with ML is written using hex or binary.

Decimal is the common form of counting; it counts from 0-9 then adds one to the tens column. Hexadecimal counts from 0-15 and increments the "tens". "Tens" in hexadecimal is really "16s". Because single digit numbers stop at 9, the letters A-F are used to represent 10-15. It does not take long to get used to this system.

Hex and binary are the most convenient to use because at their fundamental level, computers operate in binary (on/off).

A memory location (byte) on most micros is made up of eight binary cells (bits) which can each be on or

off:

```
BIT7 X X X X X X X X BIT0
```

The value of a bit which is on, is its bit number to the power of two. "Power" means a number multiplied by itself. If BIT7 is on, its value is 2 to the power of seven =  $2*2*2*2*2*2*2 = 128$

Because 16 is an integer power of two ( $2^4$ ) and 10 is not, it becomes easier to view programming in terms of the machine's language by using hexadecimal.

You may have noticed that attempting to POKE a number greater than 255 results in an "illegal quantity error" message. Referring to the byte diagram you can see why that is. If all the bits in a byte are on, their total value is  $128+64+32+16+8+4+2+1 = 255$ . To POKE over 255 requires more bits than a single byte has got, thus the error. A legal POKE — eg

POKE 1024,163 — sets the bits in location 1024 as follows:

```
BIT7 1 0 1 0 0 0 1 1 BIT0  
128+0+32+0+0+0+2+1 = 163
```

Looking at it in hex, the eight bits can be split into two groups of four. The bits 7-4 (high nybble) are the number of 16s, ie  $8+0+2+0 = 10 = A$ .

The bits 3-0 (low nybble) hold the units ie  $0+0+2+1 = 3$ . Thus you have  $(10*16)+3 = 163$ . In hex, this would be written as A3.

Anyone who would like a copy of the excellent public domain monitor, "Supermon", for the Commodore 64 should send a cassette or disk and a stamped return envelope to:  
J. Colquitt,  
6 Martin Ave.,  
Mt Albert,  
Auckland.

This following program will convert decimal to hex and binary:

```
200 HEX$="0123456789ABCDEF"  
205 INPUT"DECIMAL, 0-255";DB:DH=DB  
210 PRINT:FOR I=7TO0STEP-1  
215 IFDB-2^I>-1THENPRINT"1";:DB=DB-2^I:GOTO225  
220 PRINT"0";  
225 NEXT:PRINT" ";  
230 HN=INT(DH/16):LN=DH-HN*16  
235 PRINTMID$(HEX$,HN+1,1)MID$(HEX$,LN+1,1)  
240 PRINT:GOTO205  
READY.
```

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# PC Jr cut — a 'big blue'?

By Gaie Ellis

There was no surprise at all for journalists when "Big Blue" announced yet another improved net profit (before tax) for the 1984 financial year . . . in fact, more than double the previous year's figure, at \$19,568,000 compared with \$7,783,000 in 1983.

However, there was a surprise a few days earlier when IBM in the States announced that production had stopped on the PC Junior. And it seems possible that even IBM New Zealand was a bit surprised by the announcement, although it has made no mention of officially introducing the PC Junior here.

Certainly, there were some dealers and users surprised and a bit upset that the Junior won't be seen here. And given the delay in the introduction of the IBM AT because of faults with the drive, people might be forgiven for getting a bit impatient and a bit grumpy.

The new CAD/CAM package, laser printer and LAN products will be greeted with enthusiasm in their respective markets. But it's the small to medium sized business user, the PC person, who can justifiably feel miffed.

Apparently, production on the PC Junior was dropped after only 12 months because the demand was not as great as expected — presumably in the

US market — and while IBM New Zealand would not speculate on unannounced product, the general feeling seemed to be that it's unlikely the gap would be left open for long.

There are reports of the PC Junior already being landed here by some dealers bringing them in direct or users purchasing overseas. Purchasers looking for service for these units will have to look to their source of supply. IBM NZ made a conscious decision not to release the Junior here and will not be providing support.

On the AT front, supplies are apparently now becoming available, although the problems with the drives have resulted in a backlog of orders.

Not to be too harsh IBM did announce 700 new products in New Zealand last year and internationally has made a vast investment in research and development.

The New Zealand revenue growth was balanced across all product areas with major gains in education and homes with the PC, according to chairman and managing director, Basil Logan.

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# Knowledge becoming power

"Capital and energy is being displaced by information and knowledge as the power base to convert resources into products and services" — Dr Neil Bell, Harvard University.

The chairman and managing director of IBM New Zealand, Basil Logan, says this displacement is in evidence all over the world where the trend is toward a service economy with information replacing capital as the lever for the future.

He draws on some American experiences to illustrate the point:— 4% of the workforce is in agriculture producing food for the nation and export and achieved by investing \$75,000 worth of machinery in every US farm worker.

— 17% of the work force produces most of the capital goods required with an average of \$40,000 machinery/equipment invested in each industrial worker.

— for the office or clerical worker, only \$2500 per capita is spent on equipment and the productivity is correspondingly lower.

For the data processing industry this means the personal computer, the terminal, the work station, provided

massive opportunity for the industry, says Mr Logan.

It's estimated in USA that by 1990, 30 to 35 million service economy workers will be direct users of work stations costing less than \$12,000 and work stations will account for more than half the value of all data processing products shipped in the early 1990's. These developments, in turn, point to the individual becoming a primary source of demand for computer products requiring new channels of distribution and products that are easier to use.

Illustrating the transition faced in technology, Mr Logan says that in the past 25 years, price/performance has improved about 10,000 times (four orders of magnitude): it is an improvement of only two orders of magnitude which sparked the industrial revolution in the western world 200 years ago!

"With the technology we already know about there's about four or five more orders of magnitude to go in price/performance. A recent study predicts there will be 10 million personal computers, from all manufacturers, in USA by the end of 1985, two-thirds of them in households."

## Macproject

Macproject, due for release in New Zealand by CED Distributors, is a software package designed for the Macintosh which will suit advertising agencies and other businesses requiring precise planning and management of projects involving diverse services and equipment.

It allows operators flexibility when designing and scheduling projects, according to marketing manager Mal Thompson. Users can draw a project schedule on the screen, enter the detailed data for each facet of the operation and Macproject calculates the beginning and ending dates for each task and the whole project.

He says the software will be particularly useful to vertical business environments, and cash flows for each part of the project can be determined.

It can handle up to 200 tasks on Macintosh 128K; or up to 2000 on the XL or 512K, handling up to six resources per task with a maximum of 50 resources per project. It is available for \$395.

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# An AppleWorks love affair

By John MacGibbon

Apple's integrated AppleWorks program has become one of the world's hottest software products. It is also convincing a lot of II Plus owners that it's time to upgrade to a IIe or IIc.

I've had the program for a couple of

months now, and I've fallen in love with its word processor and database features. However, I'd had no real need to use the spreadsheet, and hadn't given it more than cursory attention.

Until I got embroiled in the tricky

business of selling and buying a house. Finally, I had an incentive to extend my spreadsheeting experience beyond Multiplan, and into AppleWorks.

Buying and selling at the same time has more traps than just buying a house, and as the various offers and bids fly around, it can be handy to be able to make quick assessments of your financial situation, so that you can look at things like:

- What real estate commissions and stamp duties will you have to pay?
- What "profit" or surplus will you get from sale of your present house, after deduction of the mortgages you owe on it?
- Given the above surplus, if you add your savings and take into account legal and estate agent rake-offs, what level of new mortgages and other loans will you need to secure your dream home?
- Can you still afford your dream home if ungrateful prospective buyers of your existing property aren't offering what you reckon it's worth? Can you juggle figures for mortgages, savings, overdrafts and so on, to achieve your goal? (remembering that there may not be much room to manoeuvre on mortgage borrowings, as most lenders will not allow repayments to exceed a certain percentage of your gross income, usually 20-25%).

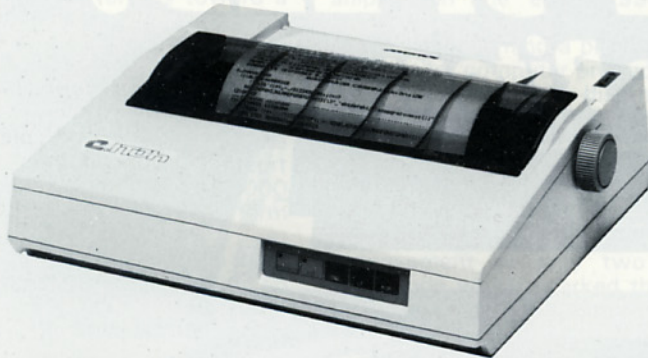
These are just some of the questions any prospective home buyer and seller ponders, usually on the back of an envelope. It's a lot quicker with a spreadsheet - which can automatically calculate such figures as estate agent and stamp duty charges. These vary depending on selling and buying price levels.

Now that I had some motivation to open the AppleWorks manual and get started, setting up the spreadsheet was straightforward - an evening's work. This was a relatively simple model as spreadsheets go, but was noticeably easier with AppleWorks than it would have been with Multiplan.

Of course, much of the hard work had already been done - like sussing out my financial situation, discovering typical charges for lawyers and valuers, and finding out formulae for agents' fees and stamp duty.

The accompanying table shows a typical workout for this spreadsheet. The model has been modified somewhat from the original, by adding some savings and finance categories. My own figures have been replaced by hypothetical figures.

While I have used AppleWorks, the general principles could be applied to any other spreadsheet, such as Multiplan, Lotus 1,2,3 or VisiCalc.



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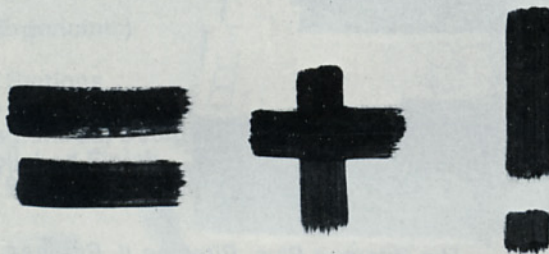
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# Setting up the spreadsheet

AppleWorks has the rather nice feature of letting you keep typing merrily across column boundaries, as long as you don't impinge on information in existing columns to your right. So the first step is to type in everything except the figures, as per the example. Later on, when you've got the spreadsheet working, you could add or delete categories, as appropriate.

Next, you might as well fill in some notional figures, preferably those in this example, because then you will be able to quickly check if your spreadsheet is working properly.

However, don't fill in figures yet for the categories of: total repayments, total additions, estate agent commission, stamp duty, total selling/buying costs, or total funds available. Each of these categories calculates its own figure, using formulae you provide.

The simplest formulae are those that simply add up a few figures. For instance the formulae for "total repayments" is "@SUM (E15 . . . E17)".

(Note: in this article, quotation marks are not part of the formulae.)

First, put your cell pointer on cell E18. Type "@SUM(". This will appear on the line underneath the spreadsheet page. Now move the cell pointer to cell E15. Press "Return", (you'll hear a beep), and "E15" will join the formula at the bottom of the page.

Now type three periods, move the cell pointer to E17 and press RETURN again. "E17" will join the formula at the bottom of the page. Add in a right hand bracket, and the formula is complete. As soon as you either press RETURN or move the cell pointer to another cell, the total for the cells E15, E16 and E17 will appear magically in cell E18.

All other formulae for totals are calculated in a similar way except for "total funds available . . .". This has to perform a subtraction, as well as two additions. The formula is: "@SUM (F20+F28-F39)".

Estate agents' commission is based on 3% of selling price plus \$100. To enter the formula, put the pointer on cell E32 and type "@SUM(F9\*.03)+100". (Cell F9 is where you entered your selling price, at the top of the spreadsheet.)

Stamp duty on your new house purchase is a little trickier. The charges are 0% for the first \$50,000; 1.5% for the next \$50,000; and 2% for everything over \$100,000. The spreadsheet formula, which will be entered into cell E33, has to cope with three different levels of calculation. Look at the bottom line of the example to see the formula. (Start typing at the "@" sign.)

Now you should tell AppleWorks to present all figures in "commas" format as per the example. The quickest way to do this is to take your pointer to the top of the page and press "Open-Apple-L". From the options presented, select

"block", and follow the instructions to highlight your complete spreadsheet. Pressing RETURN will reveal a further set of options. Choose "commas", press RETURN, and hey presto, you've got commas everywhere.

Your spreadsheet is now essentially complete. There is just one thing left to do. You must protect all the cells that contain formulae. Otherwise someone may accidentally enter figures in these cells and destroy the formulae.

Put the pointer on the cell to be protected and press "Open-Apple-L". Then make the following choices as they are offered to you: "entry", "protection", and "nothing".

At this point the figures on your spreadsheet should be the same as in the example. If they are, things are working OK, and it's time to start entering your

own figures.

In the example, you are selling for \$95,000, and buying for \$138,000. Unfortunately, the spreadsheet says you won't quite make it. So you might have to push for a higher price on your existing house, cut your suit to fit your cloth, or touch a wealthy relative for a (low interest??) loan.

A useful addition to this spreadsheet was the mortgage repayments calculator included on the "loan schedule" file on the samples disk that comes with the AppleWorks package. Use the "copy" function to transfer the few rows shown in my example.

The AppleWorks sample disk also has spreadsheets for personal budgeting and calculation of net worth. With suitable modification, these would also help players in the real estate stakes.

```
File: HOUSECALC.eg          REVIEW/ADD/CHANGE          Escape: Main Menu
-----A-----B-----C-----D-----E-----F-----G-----H-----
1:      HOUSE BUYING AND SELLING CALCULATOR
2:
3:
4:      NOTE:  First fill in your buying and selling prices.
5:      Deduct chattels because their value is not
6:      included in stamp duty levies.
7:
8:
9:SELLING PRICE FOR EXISTING HOME          $95,000
10:BUYING PRICE (less value of chattels)    $138,000
11:
12:
13:DEDUCT REPAYMENTS ON EXISTING HOME
14:
15:      First mortgage          20,000
16:      Second mortgage         0
17:      Third mortgage          0
18:      TOTAL REPAYMENTS       20,000
19:
20:GROSS SURPLUS FROM HOUSE SALE          75,000
21:
22:ADD:
23:      Savings - ANZ Savings Bank    2,300
24:      Savings - Post Office         3,000
25:      Building Society              8,000
26:      First mortgage                50,000
27:      Second mortgage               5,000
28:      Bank overdraft                1,000
29:      TOTAL ADDITIONS              69,300
30:DEDUCT SELLING/BUYING COSTS:
31:
32:      Estate agent commission      2,950
33:      Stamp duty                    1,510
34:      Other legal costs - buying    750
35:      Other legal costs - selling   550
36:      Valuation - existing home     200
37:      Valuation - new home          250
38:      Carrier & misc. costs        500
39:      TOTAL SELLING/BUYING COSTS    6710
40:
41:TOTAL FUNDS AVAILABLE FOR PURCHASE      137,590
42:-----
43:
44:      MORTGAGE PAYMENTS CALCULATOR
45:
46:      Loan Amt          50000
47:      Pmt/Yr           52
48:      Total Yrs        25
49:      Interest         17 %
50:      Interest         .17 Decimal
51:      Interest 18.49762 % (APR)
52:      Payments $165.84
53:-----
E33: (Value, Layout-C0) @IF(F10>100000,(F10-100000*.02)+750,F10-50000*.015)
Type entry or use @ commands          @-? for Help
```

## New profile

Apple has introduced a new version of the profile hard disk drive that doubles the disk's storage capacity to 10 megabytes. The increased capacity provides an increased mass storage capability that business users have been looking for with Apple.

The 10mgB profile is a stand-alone unit that allows programs and data files to be stored in a centralised location. The equivalent of 70 Apple II floppy disks (about 4800 single-spaced, type-written pages) can be stored on a single drive. The drive also retrieves information 10 times as fast as a conventional floppy disk drive, according to Apple.

# Moving pictures: part 1

By Joe Colquitt

One of the features of the Commodore 64 is its moveable object blocks, or "sprites" as they are more usually known. Anyone who has played games on the 64 has seen them. When used with imagination, they can give a program a sense of realism. To the beginner, however, imagination is often thwarted by the apparent complexity of working with sprites. There is a system

that can be used with sprites to make programming simpler, and all the user has to do is decide what is required.

Sprites have several parameters:

- on or off
- position
- shape
- colour
- (un)expanded
- collisions
- priority

To make a sprite appear, several conditions need to be met. As long as

you remember this for each sprite, controlling them won't be too hard. If you read this article with a sprite register map, it will be that much clearer. The first two parameters are necessary to make sprites appear, and the other five are optional. I say they are optional because all registers are set to 0 when the machine is switched on, and in some cases (such as colour) that may be what is required.

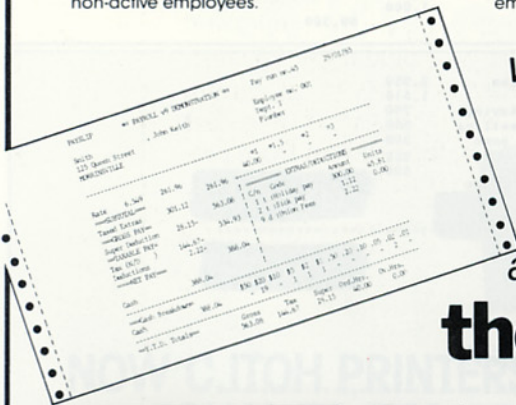
To use some registers, a little understanding of bits and binary is needed. Registers which control enabling, priority, multicolour, expansion, collisions and position high bit are all one byte each, yet must handle eight sprites. Therefore, each of the eight bits in the byte is assigned to a sprite. For example, one byte can hold all eight priority statuses.

I prefer to use variables in sprite work, as it avoids the use of five-digit addresses all over the place and the BASIC interpreter runs faster with variables than with absolutes. I almost always use V (for video). Before trying any of the examples, be sure to set V to 53248.

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## Sprite enabling

Location 53269 (V+21) is the sprite enable register, and bits 0-7 correspond to sprites 0-7. Sprite 0 is turned on by "POKEV+21,1"; Sprite 7 is turned on by "POKEV+21,2<sup>7</sup>". In general, to turn a specific sprite on, POKE V+21 with 2<sup>n</sup>sprite number. If more than one sprite is needed, add the value — to enable sprites 0,3 and 6, poke V+21 with 2<sup>0</sup>+2<sup>3</sup>+2<sup>6</sup>=1+8+64=73. By the same token, to turn a sprite off, set its bit in the register to "0". This principle applies to all registers that hold eight statuses.

## Sprite position

Each sprite has a pair of registers to hold the horizontal and vertical coordinates. Starting at 53248, the even numbers up to 53262 are horizontal registers, and odd ones up to 53263 are vertical registers.

SPRITE	HORIZ	VERT	V+
0	53248	53249	0,1
1	53250	53251	2,3
2	53252	53253	4,5
3	53254	53255	6,7
4	53256	53257	8,9
5	53258	53259	10,11
6	53260	53261	12,13
7	53262	53263	14,15

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# COMMODORE 64

The programmer's guide (PP156-157) gives the viewing perimeters for sprites, but roughly they are 24-255 (hor) and 50-229 (vert.) The tacky part of horizontal positioning is at the point when the sprite goes through pixel

position 256. It can go this far to the right because the screen is 320 pixels wide, and as you should know, an attempt to poke a byte with more than 255 causes an "illegal quantity error".

To allow the sprite to travel to position

320, a bit in a separate register (V+16) can be set to 1. The sprite's horizontal register proper then starts counting from 0 again. The net effect is that the actual position is:  $((V+16 \text{ bit value}) * 256) + \text{horiz register value}$ . To see it more clearly, run this small program.

```
10 V=53248:REM SET VARIABLE
20 FORI=0T063:POKE12800+I,255:NEXT:REM USE 'PAGE' 200 AS ONE SHAPE
30 FORI=0T063:POKE832+I,170:NEXT:REM USE 'PAGE' 13 AS ANOTHER
40 POKEV+21,8:POKEV+6,160:POKEV+7,140:REM ENABLE SPRITE 3,SET POSITION
50 POKE2043,200:REM SET SPRITE 3 POINTER (12800/64=200)
60 FORI=0T0200:NEXT:REM DELAY
70 POKE2043,13:REM CHANGE SHAPE (832/64=13)
80 FORI=0T0200:NEXT
90 GOTO50:REM CHANGE SHAPE
```

The next important requirement for a sprite is to have its shape defined. To do this, each sprite has a pointer which holds the location of the required shape. These eight pointers are normally at 2040-2047 (they can be moved if a

different video bank is used). To set a sprite to a particular shape takes a little calculation. The video system of the C64 can access only 16K (a bank) at a time. A sprite shape requires 64 bytes in memory, therefore a bank contains

$16384/64=256$  available shapes. To set a sprite to a shape entails poking that sprite's pointer with  $(\text{shape address})/64$ . To illustrate, try another small program. A particular sprite shape is known as a page.

```
10 V=53248:B=344:C=1
20 POKEV+21,1:REM ENABLE SPRITE 0
30 POKEV+1,140:REM SET IT ABOUT HALFWAY DOWN THE SCREEN
40 FORI=ATOBSTEP
50 HB=INT(I/256):LB=I-HB*256:REM HB IS THE HIGH BYTE VARIABLE
60 POKEV,HB:REM POKE SPRITE 0 HOR REGISTER WITH LSB'S OF COUNTER
70 POKEV+16,HB:REM SET BIT 0 OF V+16 ACCORDING TO THE STATE OF THE LOOP
80 PRINT "3"
90 PRINT "3"LB;HB;I
100 NEXT:IFA=0THENA=344:B=0:C=-1:GOTO40:REM REVERSE THE LOOP
110 A=0:B=344:C=1:GOTO40
```

## APOLOGY

By **Whitcoulls Limited**  
to **Messrs Corbett Thomas Ellis and Phillip George Ellis**, Auckland

On pages 11-13 of the volume 2 no. 3 summer 1984 issue of the magazine "New Zealand Computer Reviews", published by **Printed Matter Associates Limited**, Auckland, there was an article entitled "The Last Days of Access Data". **Whitcoulls Limited** was the printer of this issue of the magazine.

Messrs **C.T. and P.G. Ellis**, who are directors of **Access Data Corporation Limited**, have complained that this article contains statements defamatory of them. They have issued proceedings claiming damages for defamation in the High Court at Auckland against the editor and publisher of the magazine and the author of the article in question and, also, against **Whitcoulls Limited**, as the printer.

**Whitcoulls Limited** claims that as the printer only of the magazine, it neither had nor reasonably could have had any knowledge of the truth or falsity of the statements in the article in question; it acted innocently; it exercised all reasonable care in the printing of the magazine and, in particular, it had no effective means of acquiring knowledge of or controlling its contents and had no reasonable opportunity of checking the same; the material to be printed came to it "pasted-up" and "camera-ready" for the production of printing plates and printing by an offset process; it did not do the typesetting; it did not and was not expected or paid by the publisher to proof-read the material; it did not know or could not reasonably have known that this issue of the magazine contained any defamatory material.

Nevertheless, if, as alleged, this article did contain statements which are defamatory of Messrs **C.T. and P.G. Ellis**, **Whitcoulls Limited** retracts the statements and apologises to them.

This apology is made without prejudice to any defence to the proceedings issued which **Whitcoulls Limited** may have.

**Whitcoulls Limited** by its solicitor and duly authorised agent: A.J. Forbes, Duncan Cotterill & Co., Solicitors, Christchurch.

As you can see from this example, it is quite easy to construct a series of pictures and make them appear to move by just changing the pointer number. The loops in lines 20 and 30 drew the shapes, and what appears on the screen is actually a picture of a 64 byte chunk of memory. If you have a programmer's guide, you will see in the memory map, at locations 160-162, the three bytes the timer uses.

Set up a sprite with page 2 as its shape, and you can watch the timer working. Page 2 encompasses the locations 128-191 ( $2 * 64 + 63$ ) inclusive. However, to draw even the simplest of shapes can mean a lot of data and paperwork. Next time, I'll try and take some of the heartache out of it.

Meanwhile, if you want to save a lot of time, work and grief, yet still produce magnificent sprites, I can supply you with a copy of **Alpine Computing's** latest sprite editor for the C64 with full instructions, sample files, programs and printouts. Send \$24.95 and your address to:

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# Programming morsels

By Jeff Whiteside

Everyone likes to learn how to make a computer perform new tricks. Much of the operating system is mysterious and yet can be very useful. But how do you learn about it? Short of looking through many books, unless you happen to know someone who is well advanced in programming, those clever little tricks will pass you by.

This article is an attempt to counter this by presenting in one place a selection of useful tidbits. The only way to spread this knowledge is to share. So feel free to teach someone else what you learn here. And how about sending your own hints, tips etc to me (c/o *Bits and Bytes* so that another useful collection may be published in future? Even one item is worth sharing.

Now to a dozen bits of business:

**1.** To suppress a question mark for an input statement, POKE 19,1. No space will be put between the input prompt and the typed input so you may need to include a space at the end of the input prompt.

**2.** You can achieve the same result by opening a file to the keyboard. An

input from this file will not have a question mark:

```
OPEN 1,0:INPUT#1,A$
```

**3.** Location 197 stores the current keypress. Try this short program to test the value stored for each key:

```
10 PRINT CHR$(147):PRINT PEEK(197)
:GOTO 10
```

This will create a flickering display. Try pressing a few keys and note the value displayed. If you press two keys at once, the highest value is stored in 197.

**4.** Ever had trouble with the keyboard buffer containing extra keypresses and activating a GET statement when you want the person to make a choice? It happens most often when instructions are provided. A stored keypress causes you to read those instructions over again (and again and again!) Fix it with:

```
POKE 198,0
```

This will empty the keyboard buffer.

**5.** Try this for an explosion effect:  
FOR 1=0 to 255:POKE 53270,I:NEXT

Note: C64 only!!

**6.** POKE location 53280 with any number from 0 to 15 to change the C64's border colour.

**7.** POKE location 53281 with any number from 0 to 15 to change the C64's background colour.

**8.** You will already know that pressing the SHIFT key and the RUN/STOP keys together will produce a LOAD from tape followed by an automatic run. You can achieve the same effect from disk by typing a colon after a disk load command and then pressing SHIFT and RUN/STOP together. The tape LOAD command after the colon is ignored and the keyboard buffer is plugged with a RUN and a carriage return.

**9.** Try the following line in your programs:

```
0 REM SORRY YOU CAN'T SEE THIS LISTING
```

Hold it! That's not all yet. Before pressing the RETURN key, type a shifted

Description	Vic-20	Commodore 64	Disable stop,restore,list	POKE 808,100	POKE 808,225
Start of BASIC memory	PEEK(43)+256*PEEK(44)		(Note: stops clock)	POKE 802,0	or
End of BASIC memory	PEEK(55)+256*PEEK(56)			POKE 803,0	POKE 808,234
No. of open files	PEEK(112)	same as Vic	Enable stop,restore,list	POKE 808,112	POKE 808,237
Input device	PEEK(153)	same as Vic		POKE 802,243	
	Normally 0 (Keyboard)			POKE 803,243	
Output device (CMD)	PEEK(154)	same as Vic	Disable restore	POKE 792,90	POKE 793,203
	Normally 3 (Screen)		Disable save	POKE 818,73	POKE 818,32
Jiffy clock....Hours	PEEK(160)	same as Vic			POKE 819,245
....Minutes	PEEK(161)	same as Vic	Enable save	POKE 818,133	POKE 818,237
....Seconds	PEEK(162)	same as Vic			POKE 819,245
No. of characters in keyboard buffer	PEEK(198)	same as Vic	Disable repeat	POKE 650,127	same as Vic
Current colour	PEEK(646)	same as Vic	Enable normal repeats	POKE 650,0	same as Vic
Current keypress	PEEK(197)	same as Vic	Repeat on all keys	POKE 650,128	same as Vic
Reverse on?	PEEK(199)=1	same as Vic	Disable list	POKE 775,200	same as Vic
Reverse off?	PEEK(199)=0	same as Vic	Enable list	POKE 775,199	POKE 775,177
Column where cursor is	PEEK(211)	same as Vic	Empty keyboard buffer	POKE 198,0	same as Vic
Set cursor column	POKE 211,CN	same as Vic	Disable keyboard	POKE 649,0	same as Vic
	(CN=column number)		Enable keyboard	POKE 649,8	same as Vic
Which shift key pressed?			Disable upper/lower case toggle	POKE 657,128	same as Vic
...CTRL	PEEK(653)=4	same as Vic			
...COMMODORE	PEEK(653)=2	same as Vic	Enable upper/lower case toggle	POKE 657,0	same as Vic
...SHIFT	PEEK(653)=1	same as Vic			
"Cold" start	SYS 64802	SYS 64738	Clear the screen	SYS 58719	SYS 58692
Uppercase/Graphics	POKE 36869,240	POKE 53272,21	Close all I/O channels	SYS 62447	SYS 62255
Lowercase/Uppercase	POKE 36869,242	POKE 53272,23	Turn off tape motor	SYS 64776	SYS 64714
Disable stop key	POKE 808,127	POKE 788,52	Scroll screen up one line	SYS 59765	SYS 59626
(Note: stops clock)	POKE 788,191	POKE 808,239			
Enable stop key	POKE 808,112	POKE 788,49			
	POKE 788,191	POKE 808,237			



'L'. Done it? Good. Now press RETURN. If you list your program, it will stop with a mysterious '?SYNTAX ERROR' message after listing line 0!

**10.** Try pressing any key and then SHIFTed RUN/STOP. Voila! A RUN occurs!

**11.** Here's an interesting one-liner for the C64:

```
5C%=RND(1)*15:P%=RND(1)*9990:1024:
S%=RND(1)*255:POKE P%,S%:POKEP%
+54272,C%:GOTO5
```

Any other contributions??

**12.** Beware the non-random RND command! RND returns a random number between 0 and 1. But different parameters produce different results! Usually, RND(A) is used, A being equal to 1. This will produce a random number in a sequence. Use the same sequence and you get the same random number "seed" (a new sequence of random

numbers is started). Use the same negative number, and you will get exactly the same "random" number!

The solution would seem to be to use RND(-TI) to set up a random "seed" and then use a positive number. Many people use this. However, RND(0) is better as it draws an apparent truly random number based on the I/O chip clocks in the C64 and Vic-20. The same should be true of the new Plus 4 and C16.

A list of useful PEEKs and POKEs for VIC and C64 follows. Sorry, C16 and Plus 4 owners — no information at hand for your machines. Experiment with the table and let me know what works and what doesn't.

I cannot stress too much that sharing your discoveries is important. You probably all remember getting bogged down in programming. If your contribution or idea helps just one person, it will contribute to the overall strength of programming.

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## Spectrafrog

Reviewed by Barbara Bridger

Spectrafrog starts off with a cheerful tune and a display of concise instructions. But that's about all I can feel enthusiastic about.

The aim of the game is to manoeuvre a frog across a road which has four lanes of traffic travelling in each direction. There is only one level of difficulty at which the game can be played. I found this was moderately difficult and there was nothing in the game to make me want to persevere.

Spectravideo tape programs are all priced at \$18 which makes this game poor value compared to any of the machine code games.

## First steps

Excellent use has been made of the extensive graphics and sound capability of the Spectravideo to produce this four in one educational program designed for preschoolers and young children.

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The four sections of the program are called Shape Match, Alpha Match, Number Count and Simple Sums, and give practice in matching shapes, matching letters, counting, and adding, respectively.

Good instructions are provided but the screen layouts are designed to make written instructions largely unnecessary and help required from an adult minimal. My six and seven-year-olds found the screen displays very effective and were able to work out what was required in most instances.

One small fault to me is that the matching letters section did not use both capital and small letters. But overall, this program is very appealing and one of the few educational programs my children have used repeatedly.

The program is written in BASIC and requires a SV328 or SV318 with added RAM to load and run the whole program but the four parts can be loaded in and run one at a time on an unexpanded SV318. A joystick is required and this tape program costs the usual \$18.

## New releases

The release of a Spectravideo Local Area Network system which includes a 10 MB hard disk is planned for April/May. A CCITT-V21 standard modem should also be available shortly, subject to Post Office approval.

Two Swedish books have become available, one on general Spectravideo BASIC and the other on Graphics Sound and Sprites, I hope to review them.

# Sort of names

By Dick Williams

We will examine a program which sorts a list of names into alphabetical order. Many varieties of sort programs are available, each with its own particular feature. I have tried several and have found this one a good general-purpose routine for non-specialised use.

Most sort programs can be a little slow in BASIC for the very good reason that sorting is a slow activity involving moving information from its present position to a different position.

Suppose we have a list of letters starting with each letter of the alphabet, and suppose these letters are in reverse order — instead of A,B,C,D, the list is Z,Y,X,W etc.

There are 26 letters in total and your job is to sort them into a list in the correct order. You are not allowed to go to the other end of the list and read it backwards. How would you go about it?

To illustrate the general principles of sorting, make 26 pieces of cardboard about 2in square and print A 65 on one, B 66 on another. Do this with all 26 cards. Page 154 of the Sega manual will show you the correct numbers from each letter.

Then, place the cards out in a line in the back to front order from Z to A. Now look at the first pair of cards. The first is Z 90, the second Y 89. A sort program would say — if the first number is greater than the second number, then switch the cards around.

Right, we have switched the cards around so that instead of the list starting Z 90, Y 89 it starts Y 89, Z 90. Now look at the second card which is Z 90 and

compare it with the third card, X 88. The card, Z 90, is greater than X 88, so these cards are also switched around. You can see that when you have looked at each pair of cards, eventually the Z 90 card will have been moved to the bottom of the list.

Now, you have to go to the beginning of the list and repeat the process. This will move the Y card to the bottom of the list except this time, right at the bottom, when you compare the Y 89 card with the Z 90 card.

There is a difference because the Y 89 card is less than the Z 90 card so these cards are not switched around and are in the correct order. If you keep at it, eventually all cards will be sorted into their correct order.

Most likely, you will stop long before the cards are sorted out because of the time it takes to do this apparently simple task. A short list of 26 letters in reverse order takes 25 changes for the first pass, 24 for the second pass, 23 for the third pass and so on.

This adds up to quite a few computer operations and a list with only 26 letters or names is very short. You can almost sort them into order by eye. Imagine how many actions are required to sort out a very large list such as the Auckland telephone book.

So far, we have only looked at sorting out a very simple list of single letters. The number of computations rises quickly when real names have to be sorted because not only must the names be sorted into correct alphabetical grouping, but all names in a letter group

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must be placed in order. For example, Jones and James would have to be reversed to give James and Jones.

In addition, names that are the same such as Smith E and Smith A would have to be attended to and you can see there is a lot for the computer to do in sorting out a list of names into alphabetical order.

The type of sorting technique just described is far too slow for other than 10 or 20 names. For bigger lists, a faster method of sorting must be found. Fortunately, the subject of computer sorting has received a lot of attention and various methods have been developed to speed up searching procedures.

This program is a modified shell-metzner routine which splits the list of names into two halves and sorts widely separated names. The program is in four parts. The first prints on the left of the screen the list of names; the second is the actual sorting routine; the third prints the sorted list on the right-hand side of

the screen; the final part allows you to print any letter group of names on screen in the sorted order.

There is an automatic data counter at line 1003 which terminates the count on reading the last data item "ZZ", so additional names can be typed in at the next free line number, in this case line 28. The program is set up to display the unsorted names on the left and the sorted names on the right.

But of course, this is only to show you the two lists side by side. If you want to add more names or make up your own list and do not require the side by side display, delete or REM line 1005 and line 1243, and remove the TAB(20); from line 1245.

The sort as it stands is a little slow. One reason is that the sort code is spread over a lot of program lines. Tightening the code up with multistatement lines and removing spaces speeds it up a little. Sorts are inherently slow because of the great deal of work the computer has to do.

So far, I have mentioned a few points about sorting but nothing about how the computer does it. This two-line program should explain everything. Type this program in but don't run it yet:

```
10 A$="JIM" :B$="JAN"
20 IF A$>B$ then print "true"
```

Line 10 sets up two strings A\$ and B\$. Line 20 tells the computer to compare A\$ with B\$ and if it finds that A\$ is greater than B\$, it will carry on and print true. By looking at the two strings, we know that A\$ (JIM) should be after B\$ (JAN), therefore A\$ is greater than B\$ and the computer will agree with us and print true. Run it now.

The computer prints true. How does it know that JIM is greater than JAN. We know because we have looked at the sequence of letters but to the computer, letters mean nothing. It can only understand numbers.

Page 154 of the Sega manual shows the numbers for each letter and if we first write JAN and the corresponding  
**Turn to page 52**

# "If you want to do it right... XIDEX-it!"

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# Microtext v Proforma

By Pip Forer

Continuing with the topic of CAI languages, we face up with two options with extended facilities. In the red corner stands Microtext; in the blue Proforma. Both languages were sired on machines other than the BBC. Microtext began life on a Digital minicomputer and Proforma on the VAX and Poly.

Both have BBC implementations with significant capabilities. Microtext comes from Britain's National Physical Laboratory, Proforma from John Collett in the French department of Waikato University. We might look at what each offers under six main headings: text recognition, branching, graphics and sound support, interfacing to other languages or systems and editing.

Compared to BASIC, both languages have sophisticated facilities for posing questions and recognising input. Proforma has the greater specified options for questions including offering multiple choice and free format responses. Microtext concentrates on free format but with greater control.

Both have commands which can avoid the standard pitfalls of typed response such as confusion over upper and lower

case and mis-spelling leading to incorrect response to answers. Each language records student progress to date and depending on either ongoing or immediate success, can route the student to new material or impose reconsideration of questions (both languages also allow retention of student records and Proforma appears to be superior in that area).

Proforma is good on randomisation. It offers randomised response to students from a given range of replies (to let you vary the "good/bad girl/boy" message after a question without extra programming) and will randomise multiple choice question delivery for you. In general, Microtext's edge is flexible branching, including subroutine structure, while Proforma makes it simpler for students to move around within a unit in a slightly more rigid structure.

The BBC's sound and graphics capabilities can be tapped from both languages. Microtext uses a constant interface of appending \$ at the start of standard BBC BASIC commands (one suspects these are then accessed using

the routines used by BASIC). It will support any mode and, outside of mode 7, offers a variety of special characters and mathematical symbols. Proforma itself is restricted to mode 7, but offers graphics capabilities within that mode, including box drawing and the animation of moving text or graphics symbols around. For sound, it allows access to the SOUND command.

The creation and editing of files is handled in a more integrated way by Microtext which always keeps the user in its own operating "shell". This shell allows integrated running and editing of lesson sessions. With Proforma, the lesson files are created on a word processor and then actioned. This is slightly less satisfactory in many ways and makes for a rather more fragmented working process (plus you will need a word processor chip). Proforma also requires a greater initial knowledge of its various associated files to guarantee a smooth introduction.

The interfaces to other languages and systems vary considerably. Both languages run on other machines and files of instructions created for one can

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(with limitations) be moved across to others. Proforma is a far more open system than Microtext in terms of allowing tutorial material to be interspersed with alternate language programs. The value of this can not be overstated.

However, Microtext offers to eventually include facilities for linking in to video. Both use standard text files to store the author's lesson units . . . and these can be edited from a wordprocessor. A big plus for Proforma is that it has by far the better demonstration tutorial.

A final consideration is restrictions on further use of these programs. Microtext has some very nasty shortcomings for the uninitiated. It is marketed in four versions — tape, disk, ROM and network. The versions are all doctored to be non-transferable between filing systems. This may be justifiable with a network version but is a scandal with the tape version. Because of tape loading speed, this medium is totally unworkable in any practical situation but is professionally jugged with a "TAPE ONLY" message if you try to put it onto your disk. Your hundred dollars plus is not well spent here.

Microtext also has a draconian policy on licensing your lessons if you wish to distribute them for others to use. It seems that not only must you buy the language to create lessons, but National Physical Laboratory expects a licence royalty if you distribute the products of that language. This seems rather like

selling someone a hammer and then expecting one cent royalty every time a tack is driven in. One fundamental of any CAI/CAL system must be maximum resource portability, and greedy, restrictive policy like this should be discouraged.

In balance, Microtext is a more ambitious option with stronger text handling and enhanced internal links to graphics, both through video interface control and use of modes other than 7. Proforma is more modest and cheaper with one special advantage — the ability to jump out from a Proforma session, run a BASIC or other program and re-enter the session precisely where it was exited.

In some ways, this is preferable to the use of the more powerful graphics and numeric facilities within Microtext. Among other things it permits far more flexible mixing of straight CAI material (which has its limitations) with more flexible and creative material.

Compared to PILOT, these languages appear to have similar delivery capabilities but less developed editors. This latter appearance is deceptive. What they actually have is easier interfaces to a higher level of general facilities than some PILOTs, and this renders the editors less necessary. A character font/animated shape editor would have been useful, as would a graphics screen editor. But on most PILOTs to date, it is sadly true these editors are slow and disk-bound.

Microtext certainly matches the facilities of standard PILOT and exceeds them in some areas. Both packages offer a useful facility to teachers wanting to get involved with CAI. While Microtext is the more sophisticated, Proforma may offer a more flexible and simpler entry, especially for first-time CAI authors. I reviewed a disk version of both products but would be especially keen to see an Econet version of Proforma generally available.

## A new Pascal

The Oxford Pascal for the BBC is an extended ISO Pascal using a single ROM and optional disk compiling. It is cheaper than Acornsoft Pascal and requires one less valuable ROM slot. It also has the advantage of producing locatable, compiled code that can be just \*RUN without the need for a run-time module (so anyone can run your compiled program regardless of whether they have

the Oxford ROM).

A major claim to fame is that it retains much of the familiar BASIC environment — numbered lines and the BASIC editing key operations (with additional facilities). It also supports many BBC functions such as DRAW through identically named Pascal procedures. In short the transition path into Pascal from BASIC is eased.

However, as a package it is far less professional than the Acornsoft version. It provides a useful entry point for experimenting with Pascal but on balance I found Acornsoft far more satisfactory because of its greater depth, — its strong second processor options and its far superior documentation which engenders a great sense of confidence.

A worrying point with the Oxford version was that it seemed to object to some of my ROMS, and suspicion rests that it cannot cope with the DFS/NFS combined chip. Certainly, it cannot work in the second processor and my limited tests suggested it will not work under network conditions.

A new language development has been that these two Pascals have been joined by an Acornsoft P-System package of languageS (not the plural) which runs on the 6502 second processor. These, and a BBC version of the Danish structured language, COMAL, will be the subject of future reviews.



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### Televideo distributor

Data Peripherals has been appointed distributor of the Televideo terminals and printers. The company is already the New Zealand distributor for Televideo's micro-computer product range, including the new personal mini multi-user system.

# Introducing machine code

By Gary Parker

In February, I asked people to tell me what they would like to see in these Spectrum columns. The replies showed that everybody wants something different. Some people praised the software reviews; others said they were a waste of space. Some people wanted greater emphasis on business and educational topics; others wanted games, games, and more games.

However, most people agreed on a few things. They wanted more Spectrum coverage in *Bits & Bytes* (which is only to be expected since only Spectrum owners wrote in!), they were interested in the machine code routines in February's issue, and they would like an introduction to machine code programming for the absolute beginner.

So here is an introduction to machine code. I won't try to run a complete course (I learned my first machine code from a magazine, and it was frustrating having to wait a month for each issue!) Instead, I will just give you an idea of what machine code involves, so that if you like the look of it, you can buy a book on the subject and delve further.

In BASIC, you can name a variable just about anything you like, such as PROFIT or XPOS. Machine code has only seven variables called registers. Their names are a, b, c, d, e, h, l. Each register can hold only a number between 0 and 255 inclusive — the range of numbers which fits in a single byte of memory.

In BASIC, you assign values to variables using LET, such as LET a=27. In machine code, LOAD is used for LET. It is shortened to LD, so for example LD a, 27 means "load the register a with the value 27." A command such as this would be understood by an assembler program — which would convert it to numerical codes the computer can understand.

If you don't have an assembler, you have to convert it yourself. The codes are given in pages 135 to 141 of the Spectrum manual. For example, page 136 tells us that 62 is the code for LD a, N. The N stands for any number, so LET a=27 in BASIC would be LD a, 27 in assembly language and 62 27 in machine code.

The "a" register can be LOADED with a number or the contents of another register. So LD a, h means "load the register a with the value held by the register h." In BASIC, this would be LET a=h. The other registers can be loaded only with a number, for example code 6 which is LD b, N.

You can also add one to each register using INCREMENT, shortened to INC. So INC c means LET c=c+1. This is code 12. You can subtract one from each register using DECREMENT, shortened to DEC. So DEC d means LET d=d-1,

and is code 13. You can see why machine code saves space, since 13 is a lot shorter than LET d=d-1.

## Register pairs

Often you need to use numbers larger than 255. To do this, some of the registers can be combined into register pairs. The pairs are bc, de, and hl. The number held by one register of the pair is multiplied by 256 and added to the number held by the other register of the pair. If you know much about the Spectrum, you'll recognise this system, since it is also used by the system variables and suchlike (see *Bits & Bytes* October 1984 for more details). It allows numbers up to 65535 to be stored.

To assign a number to a register pair, you have to give two numbers. For example, to LOAD the pair hl with 12500, you use LD hl, 212 48 because  $48 \times 256 + 212 = 12500$ . In machine code, this would be 33 212 48, since 33 is the code for LD hl, NN.

The equivalents of PEEK and POKE are often used in machine code. Here's an example: LD (hl), b. This means "load the value held by b into the address specified by hl." It is the same as POKE hl, b in BASIC. The brackets tell you the command refers to the address specified by hl, not to hl itself. You can also load a number into an address. So LD (hl), 8 is the same as POKE hl, 8.

The equivalent of BASIC's PEEK is just a rearrangement of this type of command. An example is LD e, (hl). This is the same as LET e=PEEK hl, and means "load the register e with the value held in the address specified by hl."

The a register is used for adding and subtracting. To add the value of another register to a, you use add, for example add a, b. This means LET a=a+b. See codes 128 to 133 on page 138 of the manual. To subtract another register, you use sub. So sub c (code 145) means LET a=a-c. Although sub c doesn't mention the register a, you assume it refers to a. The a register is the only one capable of adding and subtracting.

To write useful machine code routines, you need a command which will allow looping. In BASIC, GOTO is the most common looping command. In machine code, Jump is used. There are two types of Jump, the most common being a relative Jump, which is shortened to jr. You specify how many bytes you want to jump over, so if you want to jump to a command which is four bytes ahead of the Jump command you use jr 4. Code 24 is jr DIS, the DIS being the displacement you jump, so jr 4 would be 24 4 in machine code.

When a machine code routine is finished, you want it to return to BASIC. The RETURN command, RET, is used for this. The code for RET is 201, and you'll see 201 at the end of most of the machine code routines given in February's *Bits & Bytes*.

There are many other machine code commands, but those mentioned here are the most common. These commands (and variations of them) are used in the routine given in Listing 1. It will scroll the screen attributes (the colours, flash states and so on) a square right. To use it, type in and RUN Listing 1. It will POKE the machine code contained in the DATA

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statement into the printer buffer. Use LET x=USR 23296 to run the routine. You can POKE 23297 with the attribute to fill the left-hand column.

Listing 2 is an assembly language listing of the routine, together with comments. If you go through the comments, you may be able to work out how the routine works.

While a compact article like this may make machine code seem a bit daunting, I hope you now have some idea of what is involved. If you want to learn more, buy a book on the subject. The best ones are those which are designed for the Spectrum in particular, rather than for any Z80-based computer.

**Listing 1:**

```
10 FOR a=23296 TO 23318
20 READ m: POKE a,m
30 NEXT a
40 DATA 62,62,33,255,90,14,24,
6,31,43,94,35,115,43,5,32,-8,119
,43,13,32,-15,201
```

**Listing 2:**

Assembly:	Comments:
ld a,62	load a with the attribute to fill the left-hand column.
ld hl,23295	load hl with address of last byte of attribute area.
ld c,24	load c with number of rows to alter.
ld b,31	load b with number of columns to alter.
dec hl	decrease hl by one.
ld e,(hl)	load e with the attribute in the address specified by hl.
inc hl	add one to hl.
ld (hl),e	put the attribute into the address specified by hl.
dec hl	decrease hl by one.
dec b	decrease b by one.
jr nz,-8	if b is not zero jump back to the 1st dec hl.
ld (hl),a	load the address specified by hl with a, which holds the value to fill the 1st column.
dec hl	decrease hl by one.
dec c	decrease c by one.
jr nz,-15	if c is not zero jump back to the ld b,31.
ret	if all the rows are done, return to Basic.

## 68000 CMOS chip

Hitachi is alleged to be releasing a low-power consumption version of the Motorola 68000 chip designated the HD63000 using CMOS technology. Such a device would put zing into portables and have implications for luggable machines such as the Macintosh which logically would benefit from the CMOS variant.

## From page 48

74 65 78. Closing up, we have 746578. Doing the same for JIM, we have 747377. No doubt about it, in computer language 747377 is greater than 746578 and the computer has correctly decided that JIM is greater than JAN.

But what if one word has two letters and another has 11? Fortunately, the computer can handle this type of situation as demonstrated by the example, Sandringham, and ZZ, and places ZZ at the end of the sorted list. It obviously compares equal length strings, and if one is shorter than the other, a short string is padded with spaces. SANDRINGHAM=8365786882737871726-577 ZZ =90903232323232323232

As you can see, ZZ is the greater. You will see that I have placed the names at the beginning. This is so that everything seems in the correct order — names, print names, sort names etc. And it may be easier for beginners to follow.

To make it more suitable for use, I would shift the names to the end and squeeze the code up really tight, using as many multi-statement lines as possible. Normally, I don't go to too much trouble but with a sort program everything possible to help speed up the computer should be done.

If you time a sort before and after rearranging the code you will find, for the list of names given, it is two to three seconds faster. To put the names at the end, type RENUM 10, 10, 1 then alter the data numbers to 101 102 103 etc. This will give you two sets of names, one at the start and one at the end. Delete the first set and then you are in a position to start work on changing single statement lines into multi-statement lines.

There probably isn't a great call for a sort program for home use, but many business programs rely on a sort routine

which is called into use every time a new customer is entered into the computer.

Next month, I will run through a few items about the Sega disk drive.

1 REM ----LIST OF NAMES-----

```
10 DATA BROWN J E
11 DATA SMITH N
12 DATA SMITH A B C D
13 DATA PARKINSON S H
14 DATA INGRAM G
15 DATA HOWES T
16 DATA SANDRINGHAM F
17 DATA CALDWELL N G
18 DATA JONES D
19 DATA HAMILTON B C
20 DATA AITKEN G
21 DATA WILKINSON D R
22 DATA SEDDON G H
23 DATA HAINES D
24 DATA NEEDHAM P D
25 DATA SMITH A B C C
26 DATA JAMES D
27 DATA SMITH N A
99 DATA ZZ
```

997 REM -----END OF DATA-----

998 REM ---PRINT UNSORTED NAMES-----

```
999 CLS:PRINT "NOT SORTED" : PRINT
1000 DIM A$(100):L=0
1001 FOR P=1 TO 100
1002 L=L+1:READ A$(P)
1003 IF A$(P)="ZZ" THEN P=100:GOTO1004
1004 NEXT
1005 FOR P=1 TO L : PRINT A$(P):NEXT
1006 PRINT:PRINT "SORTING NOW"
```

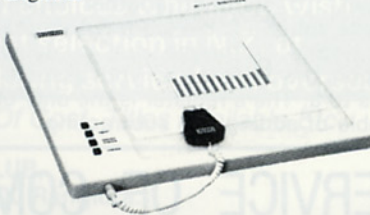
```
1080 REM ----SORT START-----
1100 M=L
1110 M=INT(M/2)
1120 IF M=0 THEN 1240
1130 K=L-M
1140 J=1
1150 X=J
```

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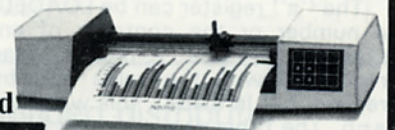
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```

1160 L=X+M
1170 IF A$(X)<=A$(L) THEN 1210
1180 T$=A$(X):A$(X)=A$(L):A$(L)=T$
1190 X=X-M
1200 IF X<1 THEN 1210
1205 IF X>=1 THEN 1160
1210 J=J+1
1220 IF J>K THEN 1110
1230 GOTO 1150
1240 REM ----SORT END-----

1241 REM ---PRINT SORTED NAMES-----

1243 CURSOR 20,0
1244 PRINT "SORTED":PRINT
1245 FOR T=1 TO L:PRINT TAB(20);A$(T)
1246 NEXT T :PRINT
1247 INPUT "PRESS CR KEY ";K$:CLS :REM

1248 REM ----SEARCH FOR NAMES-----

1250 INPUT"1ST LETR(S) OF NAME ? ";K$
:BEEP:X=0:PRINT
1260 FOR T=1 TO L
1270 IF K$=LEFT$(A$(T),LEN(K$)) THEN
PRINT A$(T):X=X+1
1280 NEXT
1290 PRINT :PRINTK$;" =";X;"   PRESS
CR KEY FOR NEW NAME":BEEP
1300 J$=INKEY$:IFJ$<>CHR$(13)THEN1300
1310 BEEP:CLS:GOTO 1250

```

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## Beyond Turtlegraphics

*Apple Logo Programming Primer* by Donald Martin, Stephen Prata and Marijane Axtel Paulsen. Published by Howard H. Sams and Co, 1984. pp453. Reviewed by Gordon Findlay.

Logo has been designed for teaching, with the expressed aim of helping pupils, of whatever age, learn thinking skills. It has been universally acclaimed as the most successful attempt so far to link education and computers. Something akin to a cult has grown up among some aficionados of the language, emphasising an entirely exploratory, experimental approach to the most widely known aspect of the Logo system, Turtlegraphics.

Few books go beyond Turtlegraphics and the use of recursion to draw designs and spirals. But there is rather more to Logo than that: it is one of very few languages specifically incorporating list and language processing. This book introduces Logo through Turtlegraphics, but continues past this to cover lists, words, inputs and outputs, interactive or humanised programming, property lists and a wide range of examples of their uses.

The book starts from the very beginning of Apple Logo, with very

explicit instructions at first, very suitable for the beginner. Great emphasis is placed on planning the approach to a programming problem and a diagrammatic representation of each program is given. Frequent use is made of a written explanation of a program – a well written explanation at that – to explain the techniques used and the details of procedures used.

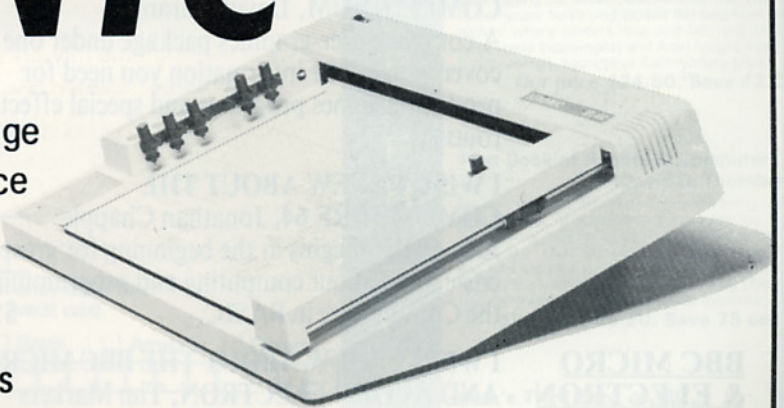
Use is made of utility or tool procedures which, once written and checked, are incorporated in programs. These are intended to be general enough to be useful in a wide variety of other situations.

Appendices include a good summary of all Logo commands, an ASCII character table, notes on managing the work space and start-up, a list of error messages (with some advice about their interpretation) and a summary of Logo's features. A tear-out card lists the main commands and editor keystrokes.

This is a readable and, as far as I have seen, reliable book. It is very readable indeed, is very well presented with clear diagrams, clear print and good quality paper. Each chapter includes questions and programming exercises. It isn't cheap, but is a substantial volume and I do recommend it highly.

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*Introduction to Data Processing by John Moss for the Modular Computer Studies Series, Input Two-Nine/Hutchinson. \$19.50. Reviewed by Gerrit Bahlman.*

Forming part of a study series of four books, three by the same author, the text introduces the reader to fundamental terminology and outlook used in electronic data processing. It is easy to read and provides excellent examples of the structure of business, the design of E.D.P. systems, related form design, system documentation and the arguments used to justify these processes.

The notion of information is dealt with in an amusingly philosophical way with the pragmatic decision being made that even facts are elusive, sufficiently so that we must resort to Descart's premise we exist because we think we do. The somewhat confused introduction to information concepts is resolved in the more pragmatic discussions

which follow. The style of the author is explicit and he does present sufficient detail and example to justify attention.

The book is an easy study and provides an important perspective on the field of data processing. Detail extends to the introduction of decision tables and even to two sorting methods, the ubiquitous bubble exchange and an inefficient version of the two-way merge sort, chosen for their simplicity.

Computer jargon is dealt with in a constructive manner, with a chapter devoted to functional characteristics of a computer system, computer languages, software (in-house versus application packages), and distributed data processing.

But the primary emphasis is in orienting the reader to the pragmatic concerns of electronic data processing. For someone wanting to obtain an overview of the rationale behind E.D.P. implementations, this book would be a good first choice.

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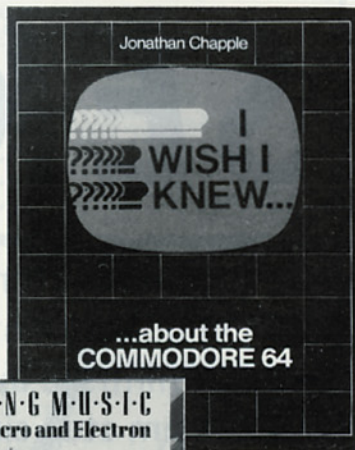
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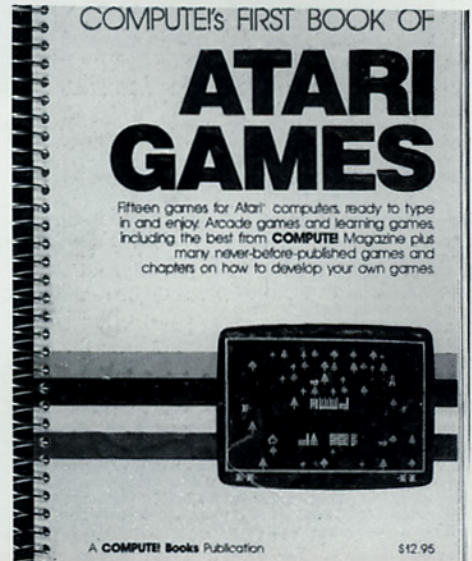
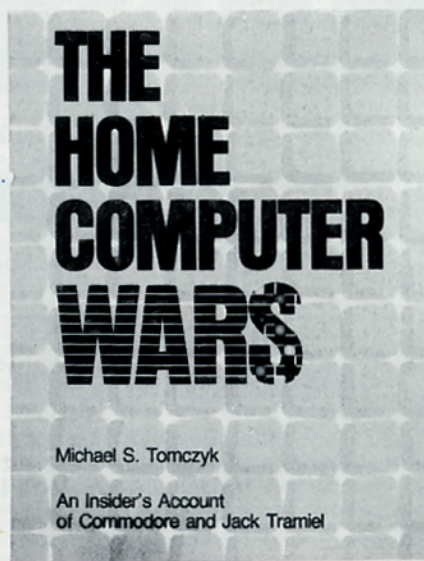
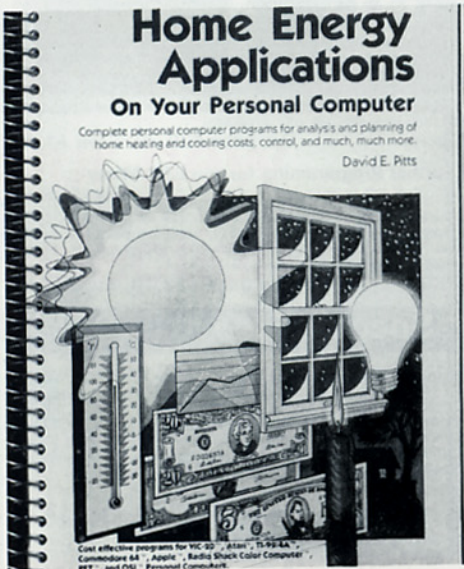
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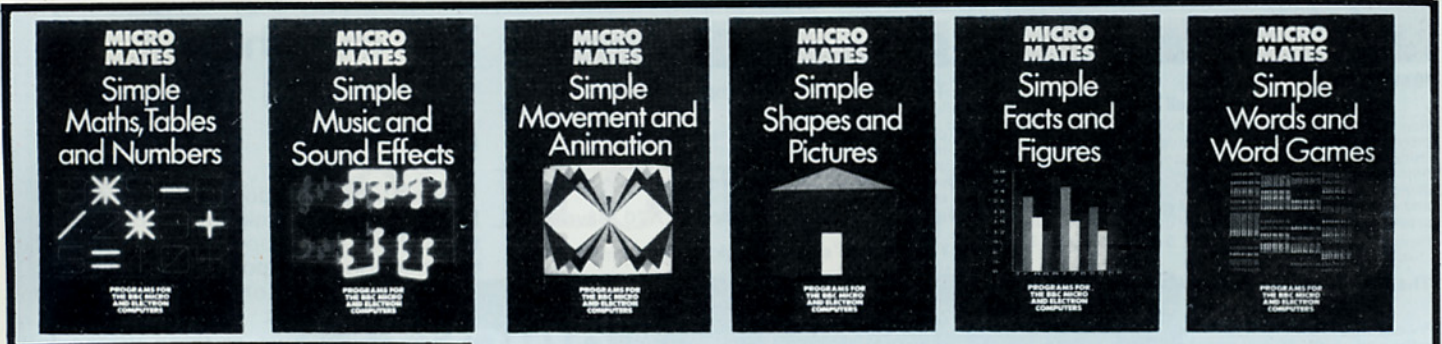
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Fully illustrated teaching guide with information for all levels. For the beginner, step-by-step operating instructions and a complete introduction to programming in BASIC, plus information on tapping the C64's graphics and sound capabilities. For the more advanced user, detailed coverage of BASIC statements and functions, an extensive memory guide indicating the most usable memory locations with explanations of what each does and how it works, and a special section on advanced colour graphics and sprite graphics.

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Barry S. Lee

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### Cracking the Code on the Commodore 64

John P. Gibbons

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David L. Heiserman

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Joseph Kascmer

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David L. Heiserman

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More than 30 programs, ranging from arcade action to simulations and adventures. They include Cowboy, Jason, Grid Iri, Asteroid Belt, VIC Skiing, and Monster Caves — plus three games to take advantage of the extra memory of expanded VICs.

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Paul Stanley

Includes multi-player games on a single screen and on a multitude of screens, multi-player innovations to demonstrate network programming techniques, multi-player classics. Each program accompanied by an outline of gameplay, with a description of the system required for play. All listings fully documented.

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### The C64 Program Factory

George Stewart

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### An Introduction to Program Design

Rod S. Burgess

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### Illustrated Guide to the Kaypro

Ken Uston

Illustrations set up so that you can master any one application without having to read the whole book. Covers all major applications — even the seemingly daunting word processing functions and spreadsheet calculations. Advice on buying a computer, which Kaypro components to buy, creating a database and tapping electronic information services and fundamental BASIC programming.

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### Apple Logo Programming Primer

Donald Martin, Stephen Pyata & Marijane Axtel Paulsen

Provides a format for learning Logo. The various elements of the language are presented in readable style, and each chapter includes practice exercises to reinforce learning. Concentrates on breaking concepts down to workable modules and a chapter is devoted to "humanising" programs so that they are more user-friendly. Develops Hangman and States and Capitals in detail.

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# Graphic excellence

By Michael Fletcher

Necromancer, from Synapse, is one of the most graphic and musical games I have ever seen on my console.

It starts with a title screen featuring some of the better music on the Atari, after which the game — and the confusion — starts. In the middle of a black screen is an unmovable wizard, you — or the instruction manual calls you Illuminar, the defender of truth and protector of the human race.

Your job is to defeat the magic might of Tetragorn, the evil wizard who controls the world into which you have been released. In the first screen, you control a wizard fastened securely to the centre of the screen by a force shield. You have to create an army of trees to defeat Tetragorn.

On the screen, you can control (with your joystick) Illuminar's wand or wisp. To plant a tree, you push the action button. The seed will grow slowly into a fully fledged fighting tree. Making things difficult on this level are ogres, riding beasts of the forest which destroy the planted tree by stomping on it.

The second of your foes is the forest spider which hates adult trees. You kill them by injecting poison. If the spider touches your force shield, you will use 200 units of shield power. To destroy the ogres and spiders, you touch them with your wisp. This screen ends when you have no units of energy left.

The second screen is very different. In

this stage, your wizard is situated on the upper left hand side of a sinister brick vault. Your mission is to destroy as many spider larvae as you can before descending to meet the Necromancer. On the far right of the screen is the army of trees you collected in the first pattern. Underneath these trees are two layers of spider larvae.

As Illuminar, you must touch one of the trees with your moving wisp and then position the tree above one of the hatching larvae eggs — pushing the fire button will plant the tree. The tree will then start growing into the vault. When the roots have broken up the bricks, your tree will crash down into the vault and smash the spider larvae. To make this task difficult are the Hands of Fate which will try to pick up your tree or your moving wizard (moving is accomplished by pushing the fire button and moving where you wish to go).

To go down to the next vault, pick up a question mark which will make a ladder appear under you. You are then free to climb down it. Again, in this level you are destroyed when you run out of energy.

The next level is a speeded-up version of the first.

Necromancer is a very exciting and graphically excellent game. I recommend it to any Atari owner with 32K and a disk drive. As yet, it isn't available in New Zealand but it can be acquired by money order from Huntingtons Computing Ltd, USA.

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APPLE II Europlus, 64K, disk drive, monitor, wildcard, joystick, 55 disks of latest software, \$2200 ono. Ph: Auck. 673-175.

FOR SALE: System 80-16K, monitor, tapes, mags. Needs some repair, bargain to electronics enthusiast. \$450 (Undelivered). G. Rose. R.D. 2, Wellsford.

WANTED TO BUY for C64 copy Speed Script either tape, magazines or photocopies. Published Compute 84, reviewed B&B Sept 84. Contact: C. Prestow, 292 Park Rd, Palmerston North. Ph: 68990.

ZX81 16K TV 130 Programs. Cost \$420. Will sell \$300 ono. Phone 2766235, Auckland.

FOR SALE Sega Home Computer Games 'Tower of Hono'i' and 'Watch Me Draw' \$15 each. Also Basic Level IIA cartridge with user manual \$16. Write to Miss C.J. Flanagan, 1 Luke Street, Dunedin. Telephone: 45-490.

COMX 35 USER GROUP. Is anyone interested in starting one up? Contact Tony Baker, 230 Howick Road, Blenheim.

DOUBLE SIDE your disks with this complete kit for only \$6.95. Please write to: "Disk Kit Offer," 15 Wilfrid St, Christchurch 4.

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FOR SALE: Cromenco system D-D CPM computer 64K, Z80, Twin 390K Drives with Hazeltine Espirt Terminal (ITOH 1550 printer and WordStar). Complete System, ready to go \$3500 or offers. Reply to Mike, Paraparaumu (058) 88-277 Business Hours.

FOR SALE: Addington Raceway, Christchurch. Surplus equipment, in good order and regularly serviced. CAISI/2 mini-computer, 16-bit, 16K core memory, three serial ports, 64 bit wide general purpose I/O board. Two Olivetti TE318 teleprinters each with keyboard, papertape reader, papertape punch. Includes assembler language. What offers? Contact J.B. Wright, Christchurch 389-094.

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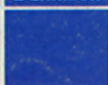


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